The OIL AND GAS JOURNAL

NOVEMBER 19

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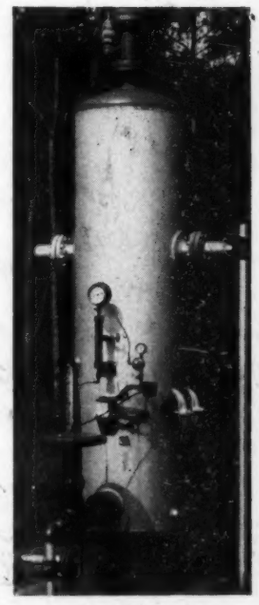

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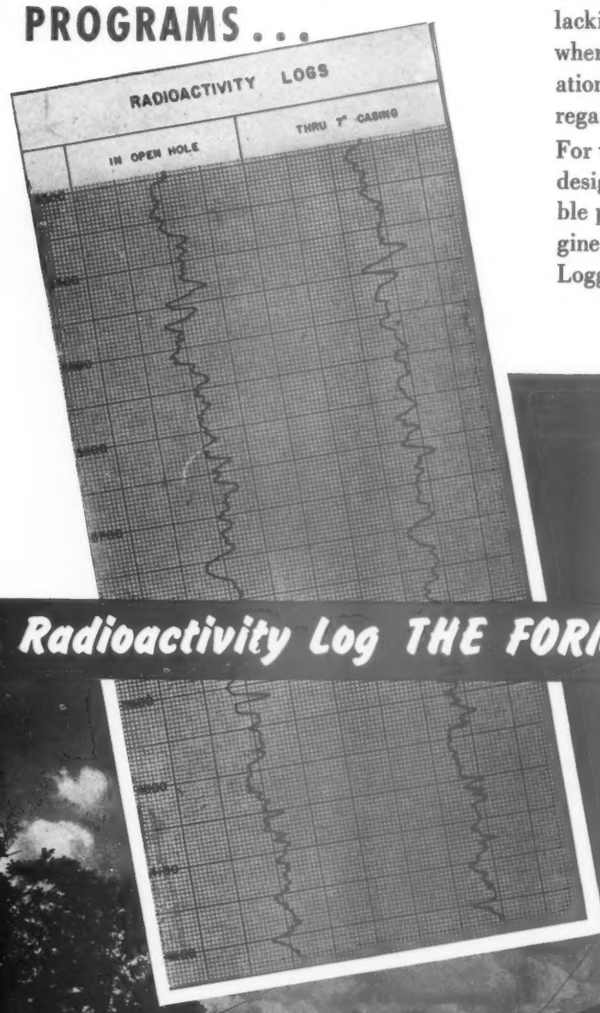

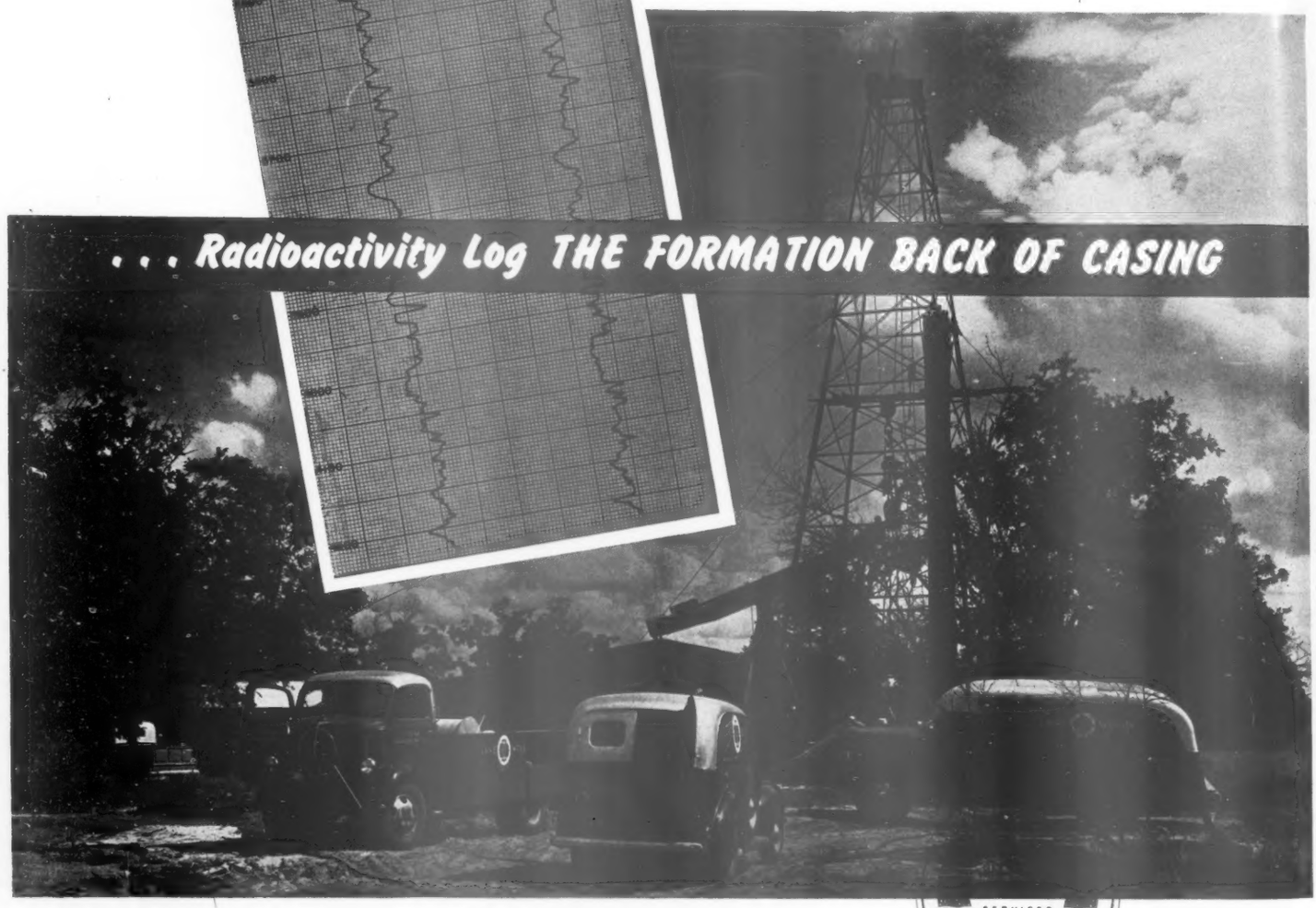

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General Heading: BAKER CEMENT WASH-DOWN WHIRLER EQUIPMENT

Unit No. A-18

Subject: The Effect of Whirler Action in Washing Formation, Removing Bridges and Cementing

BAKER OIL TOOLS, INC.
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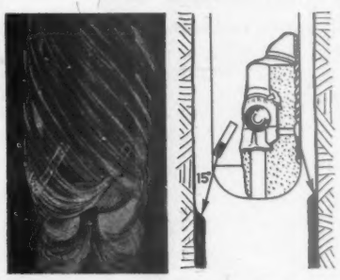
Index: 250.1
Date: November 19, 1942
Page: 1 of 1 p.

Field results have indicated that the whirler action afforded by Baker Cement Wash-Down Whirler Equipment is both effective and advantageous in washing formation, removing bridges and particularly in securing a better cementing job.

The whirling motion imparted to the fluid as it leaves the Shoe, is the basic reason for the unit's remarkable effectiveness. Another contributing factor is the slight angle from the vertical at which the fluid leaves the ports (there is no direct jetting action against the side walls of the hole).

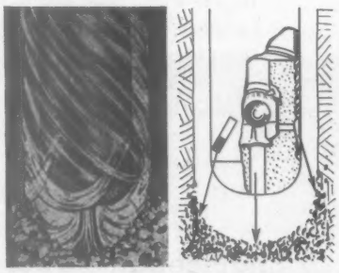
The results operators are securing in landing and cementing casing with Baker Cement Wash-Down Whirler Equipment bears out the soundness of the engineering principles incorporated in these units. The illustrative sketches below (not drawn to scale) show these principles in operation.

WASHING FORMATION



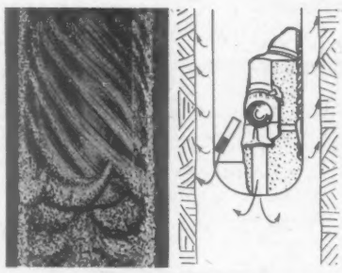
Note that the fluid is discharged through the baffled whirler ports at a slight angle from vertical (approximately 15°), effectively washing and removing at least a portion of the mud cake. There is no direct lateral jetting action against the side walls of the hole.

REMOVING BRIDGES



The angle of discharge through the baffled whirler ports of the Shoe directs the fluid against the *sides of the bridge*. The fluid which is discharged through the bottom of the Shoe also simultaneously attacks the center of bridge.

CEMENTING RESULTS

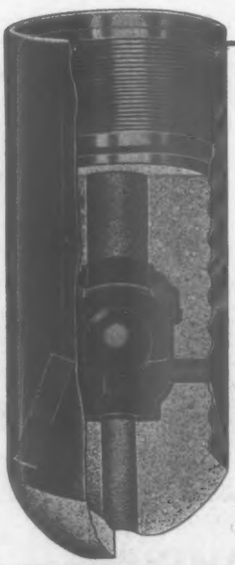


Uniform cement distribution is provided by effective whirling action imparted to fluid as it leaves the Shoe. Scouring action of the fluid preceding the cement, as well as scouring action of the first slurry as it strikes the formation, cleans the walls and affords best possible bond between the cement and formation at critical point—the Shoe and the Shoe joint.

THE BAKER CEMENT WASH-DOWN WHIRLER FLOAT SHOE

Affords These Advantages:

- It will safely guide and float the longest and heaviest string of casing.
- It has a positive-acting BALL-TYPE Back-Pressure Valve.
- It provides WHIRLING ACTION which assures best possible cement distribution at the shoe joint with minimum hazard of channeling.
- It affords easy drillability.



GET THE FACTS

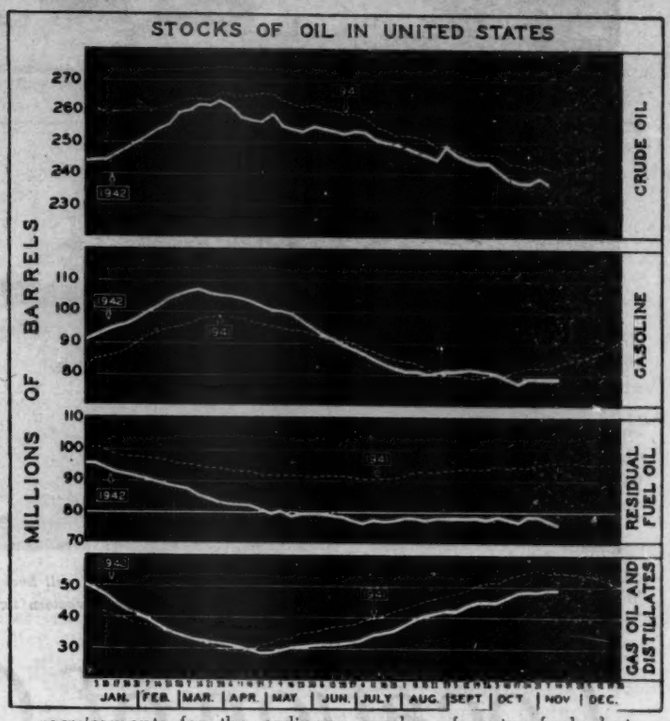
If you are not fully acquainted with Baker Wash-Down Whirler Equipment and the remarkable results operators are securing with it . . . get the facts today.

For more information, see pages 227-237 of the 1942 Baker (or Composite) Catalog, or contact nearest Baker office or field representative.

Service Note
Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

Trends

All Operators Have Better Conception of War Requirements


STOCKS OF OIL IN UNITED STATES
MILLIONS OF BARRELS
CRUDE OIL
GASOLINE
RESIDUAL FUEL OIL
GAS OIL AND DISTILLATES
1942
JAN. FEB. MAR. APR. MAY JUN. JULY AUG. SEPT. OCT. NOV. DEC.

AS a result of meetings held over the past month within the petroleum industry coupled with statements of war-agency representatives, producers, refiners, and pipe-line operators have a clearer conception of what will be expected of them in the way of supplies over the remainder of this year and for the first half of 1943. It is not so clear that operating branches will be given the wherewithal with which to accomplish the expected. It is now agreed that the domestic industry will be asked to maintain operations at least at present levels with reports indicating that the military needs due to the offensive activity of the Allied powers will expand substantially in coming months. In this connection it is apparent that domestic crude-oil production so far in November which is in line with government recommendations is running behind needs. The latest reports on stocks show that for the last week in October and the first week of November, crude-oil demand exceeded production an average of 127,000 bbl. daily.

CRUDE PRODUCTION *3,880,600 bbl. daily average—up 29,130 bbl. One year ago 4,112,885 bbl.*

CRUDE STOCKS *236,198,000 bbl. as of Nov. 7—down 3,068,000 bbl. One year ago 241,829,000 bbl.*

GASOLINE STOCKS *79,418,000 bbl. as of Nov. 14—up 180,000 bbl. One year ago 83,412,000 bbl.*

RESIDUAL FUEL-OIL STOCKS* *78,631,000 bbl. as of Nov. 14—down 494,000 bbl. One year ago 95,993,000 bbl.*

GAS OIL AND DISTILLATES *49,861,000 bbl. as of Nov. 14—up 827,000 bbl. One year ago 54,983,000 bbl.*

REFINERY RUNS *3,788,000 bbl. daily week ended Nov. 14—up 114,000 bbl. One year ago 4,010,000 bbl.*

*Last week 79,125,000 bbl.

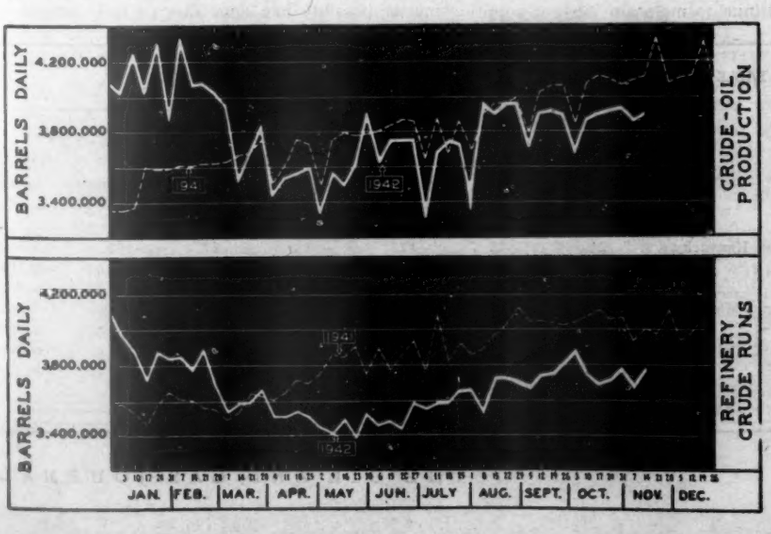
From the refinery viewpoint problems center in how managements are going to adjust their operations to meet the specific needs for certain products. In general the demand is toward the heavier products with reduced requirements for the ordinary grades of motor fuels but with a much larger output of aviation gasolines and other war products. Furthermore it is agreed that some refiners will have to adjust their operations to process large quantities of sour crude. This type operation is satisfactory where the plants are designed to process those crude which require materials capable of withstanding corrosive actions. Special chemical treating is also required. It is pointed out that substantial additions to existing equipment will be necessary before plants accustomed to operate with sweet crudes will be able to produce satisfactory products with sour crudes. This conclusion as to operations is based on the assumption that it will be necessary to draw more heavily in the future on the sour-crude sources of supply in West Texas and other areas.

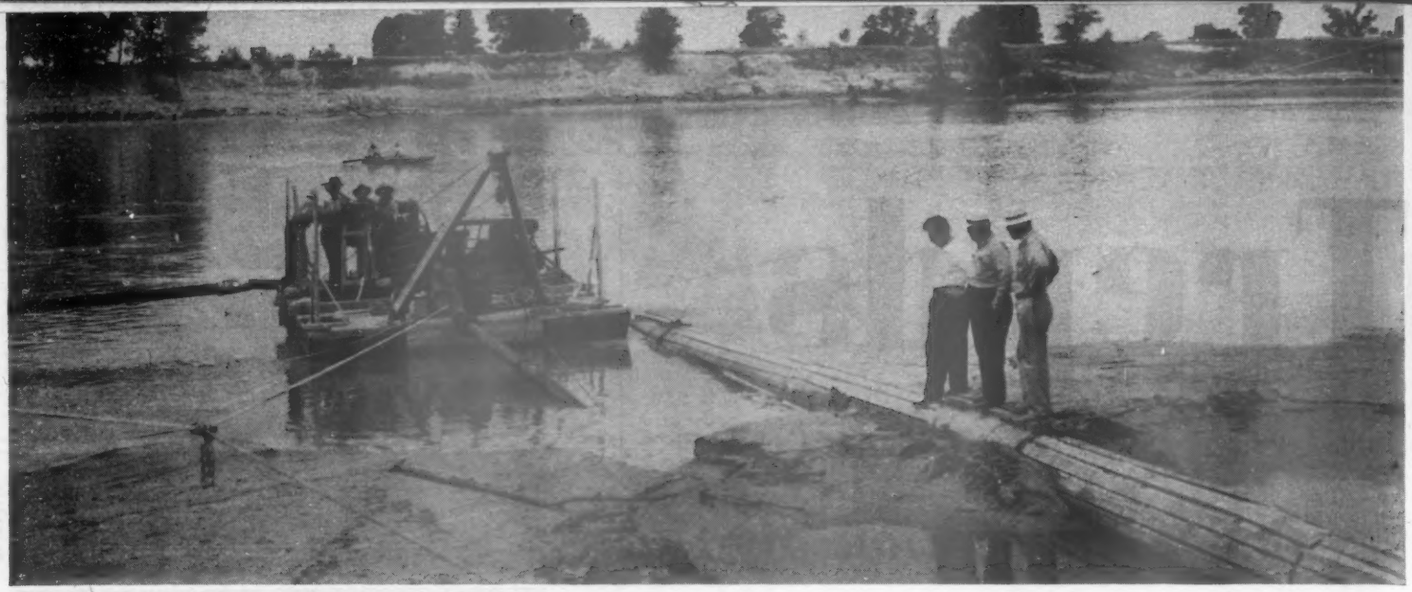
DAILY AVERAGE PRODUCTION FOR WEEK

	Nov. 14 crude oil	Nov. OPC quota all oils	Nov. 7 crude oil
Arkansas	74,000	77,200	74,200
California	742,250	782,000	706,750
Colorado	6,465	7,000	6,570
Eastern fields	90,550	105,200	97,975
Illinois	236,000	280,900	262,680
Indiana	18,150	18,400	16,125
Kansas	305,950	300,700	268,300
Louisiana	323,800	333,800	322,900
North Louisiana	*96,100*	.....	*95,200*
Louisiana Gulf Coast	*227,700*	.....	*227,700*
Michigan	65,500	64,500	62,600
Mississippi	67,100	50,000	66,000
Montana	21,820	24,800	28,680
Nebraska	3,400	3,400	3,450
New Mexico	101,450	100,600	102,340
Oklahoma	358,950	407,500	367,250
Texas	1,373,250	1,381,000	1,372,450
East Texas	*354,800*	.....	*354,800*
West Texas	*211,800*	.....	*211,800*
North Central Texas	*137,600*	.....	*137,600*
East Central Texas	*95,100*	.....	*94,300*
Texas Panhandle	*89,800*	.....	*89,800*
Texas Gulf Coast	*413,900*	.....	*413,900*
Southwest Texas	*70,250*	.....	*70,250*
Wyoming	91,965	94,400	93,200
Total United States	3,880,600	4,031,400	3,851,470

Total production, January 1-November 14, 1942..... 1,209,837,225 bbl.
Same period last year ..... 1,205,397,870 bbl.
Texas shutdown days, November 8, 14; previous week, November 1, 7.

Committees representing the war agencies are in agreement that it will not be practicable to adjust plant operations uniformly to conform to these conditions brought about by enlarged military needs, rationing in civilian use, and changes in crude-oil properties. It means, it is contended, that selective control of operations will be necessary in which each plant, so far as possible, will operate in such a manner that it manufactures those products most readily adaptable to its processing equipment and which it can market with a minimum of transportation.





Pipe line river crossings, such as this, will become more numerous as it becomes increasingly necessary to move larger quantities of crude from southwestern fields to augment declining supplies in the eastern and central states

Location of Oil Reserves Big Factor in Supply Deficiency

By W. V. HOWARD

This analysis of geographical and geological aspects of oil reserves as related to demand is the first of two articles. Detailed discussion of other areas will appear in an early issue.

THE problem of meeting the nation's crude-oil requirements is both geographical and geological. Geological considerations involve the existence of adequate immediately available oil throughout the producing fields, while the geographical problem covers the location of crude with reference to the principal refining centers and the means of communication between them.

Table 1 shows the geographical relationships of the oil fields and refineries of the United States. From this it can be seen that there was a shortage of 47,000 bbl. of crude daily in the last quarter of 1941. This was supplied by imports. Now that imports have ceased and practically all domestic oil must be transported overland, there is a shortage of 300,000 bbl. daily in the area east of the Sierras if refinery runs are to be maintained at last year's level.

From this table, it is apparent that the situation east of the Indiana-Ohio line remains practically unchanged. However, in Indiana and Illinois, there has been a drop of 158,000 bbl. in daily production and, allowing for the minor increase in other eastern districts, 154,000 bbl. more must cross the Mississippi River daily than during October 1941.

A rise in Kansas production has been more than offset by the drop in Oklahoma and Nebraska so that the quantity of oil which must be transported across the Oklahoma and Kansas state boundaries is 167,000 bbl. daily more than it was a year ago. The Arkansas-Louisiana-Mississippi area has maintained its production at about last year's level and the Rocky Mountain region shows an increase. But Texas and New Mexico are now producing 99,000 bbl. less than they did last year, so that the over-all deficiency of domestic production, with respect to the assumed normal refinery runs, is 253,000 bbl. greater than it was a year ago.

This decline in production may or may not be alarming. It may be that it is merely a matter of transportation facilities which can be augmented. However, production cannot be stepped up in all parts of the country and it is quite possible that if transportation facilities were made available to fit today's picture, local declines would make additional changes necessary before the end of 1943.

On the other hand, there is a possibility that production cannot be stepped up in any part of the country to meet the estimated demand so that the problem becomes one of locating new major fields and of drilling them up.

A third possibility is that existing transportation systems, admittedly inadequate, will become more so as time goes on. Considering this phase first, it is plain that the railroads have performed miracles in transporting oil by tank car. However, the tank cars today are carrying oil from, on the average, the Mississippi River to New York or less than 1,000 miles. The drain on the Mid-Continent and eastern fields is so great that they cannot long continue to maintain current supply so that the average haul may stretch out, say, to Dallas, a distance some 65 per cent greater.

The strain on the railroads will be greatly reduced by completion of the big-inch line from Longview to the Atlantic seaboard, but this line will not handle much more than one-third of the oil now being transported by rail so that its effect will be largely offset by the increased distance that much of the crude must be transported and the deterioration of rolling stock.

It is therefore probable that 1943 will see as much or more construction of new lines or relaying of old ones as has taken place in 1942. The question of where these adjustments will be necessary depends on the distribution of immediately available flush production and on the possibility of increased output through discoveries of major importance.

The question of oil reserves and their availability has been discussed from all angles by the industry, those governmental agencies closely connected with the industry, those which have no direct contact with it but govern prices or supplies, the Army, the Navy, the railroads and the consumer who does not know why he is being rationed. Every person who discusses the matter possibly has some fact or facts which he

TABLE 1—RELATIONSHIP BETWEEN REFINERY RUNS AND PRODUCTION
(Expressed in thousands of barrels daily)

District—	Refinery runs, Oct.-Dec. 1941	Crude-oil production, Oct. 1941	Excess or deficiency	Cumulative	Production, Oct. 1942	Excess or deficiency	Cumulative
East Coast	644	0	—644	—644	0	—644	—644
Appalachian	148	83	—65	—709	82	—66	—710
Michigan, W. Ohio, Kentucky	249	72	—177	—886	87	—172	—882
Illinois-Indiana	500	440	—60	—946	282	—218	—1,100
Oklahoma-Kansas	332	677	345	—601	664	332	—768
Arkansas, Louisiana, Mississippi	244	466	222	—379	470	226	—542
Texas, New Mexico	1,262	1,570	308	—71	1,471	209	—333
Wyoming, Montana, Colorado	86	110	24	—47	119	33	—300
Total	3,465	3,418			3,165		

considers outstanding and on which he bases his conclusion. There are many facts which, if taken alone, will support almost any view.

For example, reserves of 20,000,000,000 bbl. might be expected to furnish more than 4,000,000 bbl. daily. Assuming transportation facilities adequate to handle this production in all areas, output probably could be stepped up. However, the increase in production would cause a decline in reserves equal to much more than the amount withdrawn.

A single example will suffice to demonstrate this anomaly. In East Texas it is estimated that 500,000,000 bbl. can be added to the recoverable reserve by returning water to the sand to maintain reservoir pressures as high as possible and by restricting the withdrawal of oil. If water is not returned to the reservoir, past records indicate pressures may decline as much as 15 lb. per month. If oil production is stepped up farther so that withdrawals are faster than normal water-drive coning would ensue and ultimate recovery would probably be reduced by from 500,000,000 to 1,000,000,000 bbl. or from 15 to 30 per cent of the present reserve. The relief gained by increased production would be only temporary because when the field goes on natural decline. output will fall sharply.

Recoverable Reserves Impaired

In the same way, in every other field where proration is effective, increased production is quite possible but only at the expense of a loss in recoverable reserves, to say nothing of an increase in over-all lifting costs. Estimated reserves not only imply sufficient development to virtually prove their existence but also a continuation of current production methods.

Expressed in terms of years' supply, oil fields are of three types. The first is composed of fields on natural decline whose average future production is less than 15 times current output. The second group is made up of stripper fields whose average output may be less than one-fifteenth of their future production, although this figure is probably a fair average. The remainder are fields on proration which are, on the average, held down to less than a fifteenth of their reserves annually. These are the only ones whose production could be increased, and this increase would be at the cost of an accelerated decrease in reserves.

The number of years' supply remaining in reserve gives no direct clue to the number of years during which that oil will be produced. The more effective the proration of a field, the more nearly its years' supply approaches its productive life although even in these areas there comes a time when actual production falls below current allowables with a resulting extension of the physical life. In flush fields not on proration this relationship is easily demonstrated. For example, a field with an original reserve may produce as much as one-fourth of its oil during the first year. The history of such a field would be somewhat as shown in Table 2.

(Continued on Page 31)

TABLE 2—INCREASE IN YEARS' SUPPLY WITH DECLINING PRODUCTION

(Production and reserve figures in barrels)

Year	Reserve at beginning	Production	Reserve at end	Years' supply at end
1	100,000,000	25,000,000	75,000,000	3.0
2	75,000,000	12,500,000	62,500,000	5.0
3	62,500,000	7,500,000	55,000,000	7.3
4	55,000,000	5,500,000	49,500,000	9.0
5	49,500,000	4,000,000	45,500,000	11.4
6	45,500,000	3,000,000	42,500,000	14.2

This Week...

REFINING.—Expansion, possibly of 30 per cent, in 100-octane productive capacity recommended; approved by numerous inferior agencies, now pending final authorization of WPB . . . Central direction of manufacturing operations probable in near future. Deputy Coordinator Davies insists closely knit program vital to maximum war service. . . . Isoversion process, basically similar to isomerization technique, announced by Phillips Petroleum Co. . . . Minimum runs of 3,800,000 bbl. daily projected for last quarter of 1943; to meet essential requirements for war materials. Operations' forecasts balanced against minimum requirements for aviation fuel, toluene, and butadiene; nonessential civilian products fall where they may in future planning. . . . Fuel-oil yield lowered to 37.9 per cent on crude charged. . . .

TRANSPORTATION.—First deliveries of 24-in. pipe for eastern extension of emergency line shipped from mills. . . . Railroad deliveries to East Coast rally slightly, increase 15,125 bbl. to daily average of 768,719. . . . About 14 per cent of available tank cars are continuously in repair shops, double the normal immobolization, because of more severe service. . . . African front, its accompanying requirements for overseas delivery of petroleum, darkens hope that present number of tankers would remain in coastwise service. . . .

MARKETS.—Ceiling price of 74 cents for residual fuel, f.o.b. Texas Panhandle refineries, set by OPA. Frozen distillate-fuel prices at Minneapolis and St. Paul thawed to extent of 0.3 cent per gallon at terminals, tank wagons. . . . Natural-gasoline prices stiffen throughout Mid-Continent and Gulf Coast; suppliers unable to satisfy all demand. . . . Market structure steady and unchanged at all refining centers on major products. . . . Crude buyers, particularly Middle West refiners, search diligently for more abundant supplies. OPA restrictions only reason why premiums aren't offered. . . .

PRIORITIES.—Unconfirmed rumor circulated that repair and maintenance materials will be upgraded. . . . Canadian operators placed on priority parity with United States. . . . Construction materials, including many oil-field machines, limited in distribution by WPB Order L-192. . . . OPC striving for specific material allocation to war plants, assuring completion on schedule. . . .

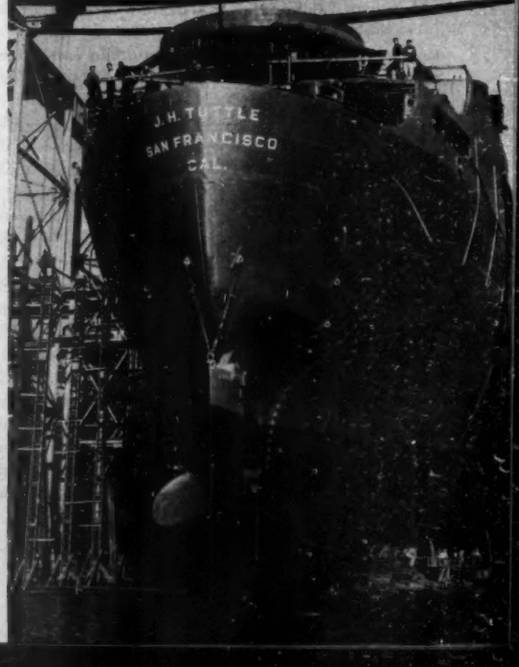
RATIONING.—Last-ditch fight spearheaded in Washington by Oklahoma congressional delegation, vigorously supported by Texas, all other nonrationed states. . . . Reduction of coupon unit on East Coast more imminent. . . . OPA virtually bans fuel-oil consumption in commercial buildings, in 30 eastern states; attempting to force conversion to fuels other than oil. WPB is sending a committee to Tulsa "in the near future" to thoroughly investigate the rubber-conservation aspects of the tubeless tire. Rationing opponents feel satisfied the evidence is convincing; rekindle hope that rationing may be delayed, in areas of abundant supplies. . . .

PRODUCTION.—Emphasis is placed on improved production methods, at A.P.I. technical sessions, as means of overcoming deficient discoveries. Indicates "green light" for secondary-recovery operations, necessary materials. . . . Equipment for completion 16,000 producing wells in sight for 1943, improvement in supply picture possible but not probable. . . .

ADMINISTRATION.—Decision promised soon on more centralized petroleum authority. Executive order, giving Coordinator Ickes some of the powers now in other agencies, reported drawn, awaiting final approval. . . . James F. Byrnes, economic stabilization director, reported in line for arbitrator's post, between OPC and OPA.

INVENTORY.—OPC mails 10,000 blanks to nation's operators asking detailed inventory on tubular goods; replies mandatory. Data reported will become basis for redistribution of supplies, taking from surplus, channeling it into essential service. OPC hopes replies will be back in Washington in 2 weeks. . . .

Critical need for tankers was intensified this week by multiplying requirements in the task of supplying military forces in Africa as well as previous theaters of war. This tanker, the largest ever built for Standard Oil Co. of California, was launched at an eastern shipyard last week and soon will join the fleet delivering supplies to all corners of the world



Executive Order Prepared to Give Ickes Greater Authority

By HENRY D. RALPH

WASHINGTON, D. C. — Authority to deal directly with problems of petroleum supply, transportation, and prices will be assigned to Coordinator Harold L. Ickes under an executive order which, it is understood, has been prepared but is awaiting final approval by the president.

The order, as presently drawn, accords Coordinator Ickes sufficient authority, informed sources report, to insure action in all recommendations to the Office of Price Administration. In case of disagreement between OPC and OPA over price recommendations, James Byrnes, economic stabilization director, will be called upon to make the decision.

The order, it is reported, will continue rationing responsibility in the hands of Leon Henderson, price and civilian supply administrator, but Coordinator Ickes will determine the over-all available supplies.

Increased voice in the petroleum-transportation matters will be assigned to Coordinator Ickes, bringing the OPC and the Office of Defense Transportation into closer harmony.

Reply to Cole's Letter

A hint that "a decision will be announced in the near future" on the proposal for further centralization of petroleum regulatory authority came earlier last week. It was contained in President Roosevelt's response to a letter from William P. Cole, Jr., of Maryland, former chairman of the petroleum subcommittee of the House interstate commerce committee. (See The Oil and Gas Journal, October 29, Page 12.) President Roosevelt advised that centralized control over oil matters has been under consideration for some time.

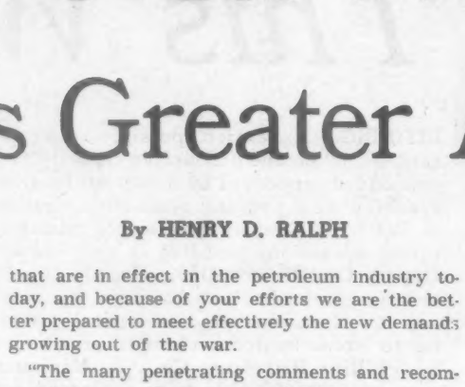
The president's letter to Judge Cole, now a member of the U. S. Customs Court at New York, follows:

"Graphically and forcefully your letter of October 22 outlines the history and the accomplishments of the petroleum subcommittee of the committee on interstate and foreign commerce during the 9 years that you have been its chairman. I can well understand the pride which you take in this record, and wish to express my appreciation of the service which you and the committee have rendered to your Government and to the people of the nation.

"The crucial importance of oil in the winning of the war cannot be overestimated. As you have so clearly pointed out, petroleum has made total war possible, and the assurance of adequate supplies of this fighting fuel for our combat forces and for war industry is indispensable to victory.

"In view of our greatly increased requirements for oil and its products, the problem of maintaining adequate petroleum reserves takes on an added significance. The immediate discovery of additional sources of oil is imperative. At the same time, production must be carried on with increasing efficiency and the wasting or improper development of oil and gas cannot be countenanced. I believe that you have wisely stressed these problems. You and your committee deserve much credit for the practical conservation measures that are in effect in the petroleum industry today, and because of your efforts we are the better prepared to meet effectively the new demands growing out of the war.

"The many penetrating comments and recommendations set forth in your letter cover a wide range of problems peculiar to the petroleum industry. In view of your long experience in oil, your views merit the most careful analysis and study. I have asked the petroleum coordinator for war to give thorough consideration to them and to take such action as may be appropriate. I am sure, also, that your thoughts on the petroleum situation will receive the close attention of all those—both in Government and in industry—who are concerned with the problems of oil and gas.



James F. Byrnes, director of economic stabilization and former justice of the Supreme Court, may become arbitrator in price-policy differences between the OPC and the Office of Price Administration

"I share your view that further centralization in the administration of oil matters is desirable. As a matter of fact, this subject has been under consideration for some time and I expect that a decision will be announced in the near future. Although the final details have not been determined I think that the contemplated organization arrangement will meet in principle the recommendations that you have made.

"Again let me express to you and to the members of the committee my appreciation of the contribution that you have made to the development of sound legislation and national policy affecting this great national resource. I am wholeheartedly in accord with your recommendation that the committee be continued. The experience and familiarity with oil problems which it has gained over the past years under your able leadership should prove of great value to the Congress in the months ahead.

"Please accept my best wishes for continued success in your judicial career."

Inventory Reports Needed to Start Supply Redistribution

WASHINGTON, D. C.—The long-awaited redistribution of oil-industry tubular goods, first contemplated 6 months ago, awaits the filing of report forms by some 10,000 oil and gas producers, the Office of Petroleum Coordinator reports.

Inventory sheets (OPC form MA-2) together with detailed instructions as to information required, have been sent to all producers, and the mandatory report calls for a tabulation of all oil-country tubular goods in the operator's possession, wherever located in the Continental United States or in Canada.

Last week, some 10,000 inventory sheets, together with detailed instructions as to how to fill them out, were sent to virtually all the country's oil and gas producers. As soon as these reports are filed, the OPC Materials Division will undertake the mammoth job of redistributing all "idle or surplus" oil-country tubular goods for "authorized uses."

First returns were expected to be coming in by the end of this week, and the hope of OPC officials is that most all replies will be in 2 weeks hence.

The report calls for a tabulation of all oil-country tubular goods in each operator's possession, wherever located in United States or Canada.

Previous to this inventory there was a so-called "sample" inventory of oil-industry supplies held by operators, covering some 50 per cent of the industry. This survey, conducted several months ago, gave insufficient data for the redistributing of supplies and so the present inventory was determined upon, according to OPC attaches.

The inventory report was issued with the approval and under the supervision of the materials-redistribution branch of the War Production Board. Any unusually large inventories held by the oil industry can be requisitioned by the WPB branch for use in the manufacture of essential war products by other industries.

Operators must file a report, in duplicate, with the OPC Materials Division of the district office in whose area the materials are located.

When a report is filed, an operator having idle or surplus equipment will be assigned a serial number. An operator who has filed his report will be entitled to purchase his requirements of oil-country tubular goods for an authorized work program from the idle or surplus inventories owned by other operators.

However, if an operator fails to file the inventory report, he will be denied authority to acquire or use any materials for oil or gas production.

Accompanying the forms sent to operators were the following excerpts from a letter by Robert E. Allen, deputy assistant petroleum coordinator:

"You are required to report all oil-country tubular goods in your possession wherever located in the continental United States or the Dominion of Canada.

"Oil-country tubular goods are defined as new or used casing, tubing, drill pipe, line pipe, drive pipe or merchant pipe.

"Used oil-country tubular goods are defined as those used materials held in inventory for use other than scrap.

"In preparing forms, please list materials fully, accurately, and in the appropriate columns on the form.

"Upon enclosed form you will deduct from materials on hand the quantities of oil-country tubular goods, specification by specification, actually used by you in the third quarter of 1942, as a minimum inventory. The resultant 'surplus or deficit' figure will be subject to such adjustment as the over-all war program dictates with respect to such minimum inventory.

"Idle or surplus inventory must be available to any supplier as defined in Preference Rating Order P-98b or to any qualified operator under that order or for other more essential war purposes. A qualified operator is defined as one who has been given authority to use oil-country tubular goods pursuant to the provisions of conservation orders of the M-68 series.

"The price at which you sell such materials to a supplier or to a qualified operator must not exceed the established price for such materials by the Office of Price Administration."

The following instructions for filling out the inventory forms accompanied them to all operators:

INSTRUCTIONS

Report of Inventory Requirements of Tubular Goods

Column 1: List type of tubular material (casing (drill pipe, drive pipe, tubing, line pipe and merchant pipe) by groups. Each group should be in numerical diameter sequence beginning with the smallest size. List only those secifications of which you have 100 ft. or more in the individual location given. Do not include any size smaller than 1 in. i.d. (1.317 in. o.d.).

Column 2: In order to have a uniform standard for reporting, all casing and drill pipe should be listed by outside diameter. Drive pipe, tubing, line pipe, and merchant pipe should be listed by nominal inside diameter except in those sizes regularly listed by outside diameter. Indicate plainly whether inside or outside diameter is used.

Column 3: It is important that the correct weight per foot as shown in manufacturer's specifications be given. Do not list a given size of pipe as being made up of mixed weights. In each case proper weight segregation must be made.

Column 4: List all specifications by grades as specified by A.P.I., such as Grade D, H-40, J-55, N-80, etc. If not covered by A.P.I., list as per manufacturer's description.

Column 5: List all entries by manufacturing process specification, namely, buttweld, lapweld, continuous weld, electric weld, spiral weld, seamless, etc.

Column 6: List in this column any end specification other than regular, such as "IU" (internal upset) "EU" (external upset) etc.

Column 7: List here thread secifications (number of threads to the inch and whether "R" round or "S" sharp), or if "PE" plain end. If ends beveled for welding, state degree of bevel.

Column 8: List here casing, drill pipe and tubing by length ranges.

Column 9: List here any special identifying specifications or trade name not covered by previous columns. If drill pipe, give specifications of tool joints. Other explanatory remarks can also be included.

Column 10: Identify all specifications by N (new) and U (used). Used items should include all tubular material the condition of which is such that it is kept on hand for use other than as scrap.

Column 11: Use this column if it is convenient to report by your major warehouse or operating division locations within the designated OPC district boundaries. Otherwise leave this column blank.

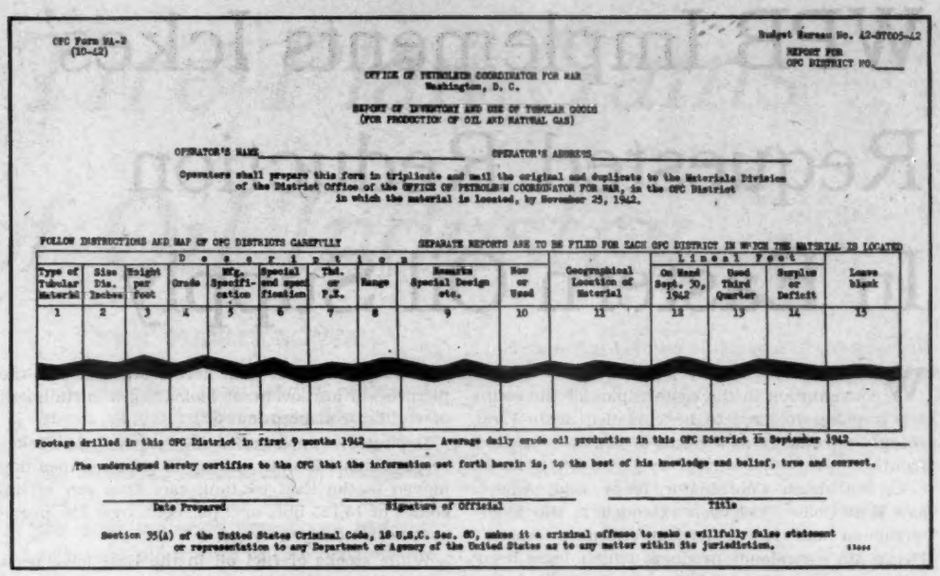
Column 12: List each specification owned by you covered by the report, whether it is in your actual possession or is held by others for your account.

Column 13: List the amount of each specification used during the third quarter, 1942.

Column 14: List the surplus or deficit remaining on each specification. This is determined by deducting from your inventory quantities equal to the amount used during the third quarter of 1942. When there are two or more entries of an individual specification, representing stocks reported in separate locations within an OPC district, the surplus or deficit should be determined by deducting the total amount of the specification used during the third quarter of 1942 from the total inventory. This puts the operator who reports by separate locations on the same basis as one who reports on a single entry for the entire OPC district.

Column 15: Leave blank.

Lower page: Show drilling footage and daily production, as indicated, for the individual OPC district covered by the report. Drilling footage reported should include all that is drilled for you whether with your own equipment or by others for your account.



OPC Form M-2
(10-42)

Budget Bureau No. 42-S7005-42

REPORT FOR
OPC DISTRICT NO.____

OFFICE OF PETROLEUM COORDINATOR FOR WAR
Washington, D. C.

REPORT OF INVENTORY AND USE OF TUBULAR GOODS
(FOR PRODUCTION OF OIL AND NATURAL GAS)

OPERATOR'S NAME_____ OPERATOR'S ADDRESS_____

Operators shall prepare this form in triplicate and mail the original and duplicate to the Materials Division of the District Office of the OFFICE OF PETROLEUM COORDINATOR FOR WAR, in the OPC District in which the material is located, by November 25, 1942.

FOLLOW INSTRUCTIONS AND MAP OF OPC DISTRICTS CAREFULLY — SEPARATE REPORTS ARE TO BE FILED FOR EACH OPC DISTRICT IN WHICH THE MATERIAL IS LOCATED

Description											Lineal Feet			
Type of Tubular Material	Size Dia. Inches	Weight per Foot	Grade	Mfg. Specification	Special end specification	Thd. or P.E.	Range	Remarks Special Design etc.	New or Used	Geographical Location of Material	On Hand Sept. 30, 1942	Used Third Quarter	Surplus or Deficit	Leave blank
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Footage drilled in this OPC District in first 9 months 1942_____ Average daily crude oil production in this OPC District in September 1942_____

The undersigned hereby certifies to the OPC that the information set forth herein is, to the best of his knowledge and belief, true and correct.

Date Prepared _____ Signature of Official _____ Title _____

Section 35(A) of the United States Criminal Code, 18 U.S.C. Sec. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Facsimile of the inventory reporting form sent 10,000 operators

NEXT WEEK

The Story of RUBBER from PETROLEUM Will Be Told

IN next week's issue every important phase of the entire story of synthetic rubber will be told—so far as it can be published under the existing military-necessitated secrecy regulations imperative for war reasons. What our statistical position is; how much rubber we have; how much we need; how fast it is being consumed; where more is coming from; from what raw materials rubber may be synthesized; which materials are best; which are most promising for meeting the critical demands; how the intermediates are made; how processed to produce rubber; what auxiliary chemicals are required; what these chemicals do in improving synthetic rubber; how good, and bad, the synthetic product is; what we may expect for the future.

Statistical data will show the nation's situation as to raw materials, capacity for producing the needed materials from petroleum and other sources. The mechanism of the Government for handling this stupendous program, never equaled by any nation since history began, will be outlined and clarified for the oil man who needs to know more about it, and for the public who wishes to know how their business is run.

WPB Implements Ickes' Requested Reduction In Eastern Oil Supply

WASHINGTON, D. C.—Gasoline and fuel-oil consumption in the eastern part of the country is going to have to be curtailed again—and sharply—primarily as a result of the new "second front."

As Petroleum Coordinator Ickes said, America's East Coast "has been extended to the Mediterranean and North African Atlantic coasts." Hence the petroleum products which have been coming in to the East will have to be spread out, so that more and more may go to the Army and Navy.

Mr. Ickes has recommended that total civilian consumption in the 17 eastern states be cut by 139,000 bbl. a day, and that consumption of gasoline in the same area be cut by 80,000 bbl. a day. This amounts to a 12 per cent cut in all products, and a 20 to 25 per cent cut in gasoline, he said.

Donald M. Nelson, chairman of the War Production Board, ordered a reduction in petroleum consumption in the eastern area shortly after Coordinator Ickes made his recommendation. Mr. Nelson's directive provided merely for an overall cut in petroleum products, and no decision has been made yet as to how much of the cut will have to be borne by gasoline, fuel oil or other types of petroleum.

In the case of gasoline, officials intend to weed out nonessential driving rather than order a flat cut.

Mr. Nelson's directive was issued to Leon Henderson as director of the Office of Civilian Supply of the War Production Board, and not as price administrator in charge of rationing.

The Army and the Navy are having to draw on East Coast supplies more than ever now, he said, and added that he will ask WPB for material to build the second pipe line from producing areas to the East Coast as soon as such a request appears to be "strategic." This second line will be a products line, roughly paralleling the "big inch" crude line now under construction.

At the same time that the second-front activities are demanding more oil, Mr. Ickes pointed out that unless the program for keeping tank cars rolling is put into effect shortly, there will be a further decline in East Coast supplies because of lack of facilities. He said John J. Pelley, president of the Association of American Railroads, had told him recently that 14 per cent of all tank cars are in the shops all the time now, because of the terrific beating they are taking in their present high-speed service.

The average age of tank cars in present service is 18 years, it is pointed out, and there are practically no new ones being built. In comparison with the percentage of tank cars in the shops all the time, Mr. Pelley said that from 3 to 4 per cent of most rolling stock is usually considered under repair at all times.

However, Mr. Ickes was told by Mr. Pelley that it is the hope of the railroads that they will continue to deliver about 800,000 bbl. of oil per day to the East Coast—but how much more of this the Army will need than heretofore is not in the picture—in any event, it looks like a curtailment of civilian consumption.

During the week ended November 7, Mr. Ickes reported that 768,145 bbl. of all products per day moved to the East by tank car. This was an increase of 15,125 bbl., or 2 per cent, over the previous week's daily average.

While stocks of fuel oil in the East have been steadily improving, he said, they aren't coming up fast enough to take care of civilian needs this winter, to say nothing of military demands.

"Only the high command," declared Mr. Ickes, "knows the number of American fighting men who have landed in Africa; the number of planes, tanks, trucks, jeeps, and other motorized equipment which they landed with them. But this much we all know: it is a large and powerful force, fully equipped with the most modern weapons. The official communique has told us that. This is enough to let us know that its oil requirements will be enormous.

"Our oil supplies are ample for all our needs—our oil fields and refineries can produce all that we require. But these supplies must be carried by our tankers over immense distances to be delivered to the battle areas. We shall deliver these supplies as they are needed and where they are needed, but this means we must devote every effort to that task, and failure to make every economy that will insure its performance would be nothing less than disloyalty to the cause we serve.

"The supply position on the eastern seaboard is bound up in this over-all problem of transporting oil to Great Britain and to Africa. Our ability to meet the extraordinary military demands of these areas is largely dependent upon cutting down our own consumption here. Failure to do this may result in the failure of some American plane to fly at a crucial moment or of an American ship to sail at a critical time.

"Possibly the completion of the pipe line to the New York area, which will not be finished until next summer, may give some relief to civilians, although we cannot even count upon that, not knowing what our military requirements will be by that time. Meanwhile, pleasure driving must be given up and only the minimum of heat maintained. All possible conversions to coal must be made. In the case of gasoline, at least, it simply will not be possible to ship it into the East in the amounts which we have been shipping, and still have the transportation we shall need for mounting military demands."

•

Oil Operators Eligible for Preferential Ration Cards

WASHINGTON, D. C. — Producers, refiners, transporters and marketers in the petroleum industry probably won't have to take such a big cut in their gasoline quotas when national rationing goes into effect on December 1 as workers in many other less essential industries.

Definite instructions, setting the limitations within which local boards may use discretionary powers, have been sent out, in Ration Order 5C, already in the hands of local boards and state directors' offices.

The regulations point out that, among other things, "preferred mileage" (which is anything over "A" and "B" cards) may be extended to a "worker, including an executive, technician or office worker . . . for necessary travel to, from, within or between the establishments or facilities listed below, for purposes necessary to the operation or functioning of such establishments or facilities. . . . (See p. 21, Order 5C.).

Among the establishments listed under this provision are:

"Industrial, extractive or agricultural establishments essential to the war effort, including: plants or establishments engaged in the extraction, production, processing or assembling of . . . munitions or fuel . . ."

This would clearly bring traveling between refineries, pumping stations or other establishments within the industry in the class of "preferred mileage."

(Preferred mileage, it must be explained, is all mileage in excess of that permitted by A and B cards. There is no top limit on what this mileage shall be within a given week, or month, but the local board sets the maximum, depending on needs).

OPA spokesmen were unable to state just how an oil man with several wells drilling would be treated in event of a request for preferential treatment for driving between these various operations, but indicated that local boards and state directors' offices within the oil country would have discretion, within the limits set by Order 5C, to rule on the essentiality of such travel in connection with the production of "munitions or fuel." It was said that such travel might be expected to be encouraged.

"B" cards, which do not come within the classification of "preferential mileage," unless the "occupational mileage" which they permit runs over the 560 miles-per-month maximum, still must be obtained by workers who use their cars in going to and from their place of employment on the basis of need. Under the new order, these workers must make a showing that they have pooled, or made an unsuccessful effort to pool, their transportation in getting to and from work.

However, operations by trucks, buses or other oil-industry vehicles subject to the Office of Defense Transportation, will be limited as far as essential mileage is concerned—and again it will be up to local boards or state OPA offices as to just how much gasoline they will be alloted. These vehicles, which include taxicabs, are the ones which previously were issued "S" cards. Under the new plan they will be known as "T" cards, and there is no "ceiling" on the amount of gasoline which will be granted under them—that, too, is discretionary with the local board.

Tubeless-Tire Plan Gains Support of Oil Industry

By H. STANLEY NORMAN

A committee composed of representatives of the rubber administrator, the Office of Defense Transportation, and the National Association of Independent Tire Dealers will come to Tulsa in the near future to investigate test records and other data on the tubeless-tire plan.

This decision of the War Production Board to thoroughly explore the rubber-saving potentialities was announced in a letter received November 17 from Grafton B. Perkins, special assistant to the rubber director. He apologized for the previous indifference displayed by Washington agencies.

POTENTIALITIES of the tubeless tire as a means of alleviating the rubber shortage were undergoing exhaustive service tests this week throughout the oil industry and plans progressed for gaining national recognition for the conservation possibilities. Hopes were entertained by numerous drivers who have participated in experiments that mandatory abolition of tubes may be invoked by the Government for the sake of channeling the rubber thus rendered idle into more recaps and victory casings.

Impetus to the program, which its sponsors visualize as possibly voiding the need for mileage rationing, was attained last week in Chicago, where members of the Petroleum Industry War Council, the American Petroleum Institute and high government officials witnessed an impressive demonstration. Executives of all sizes of oil companies joined with individuals in projecting a service-test program.

Furthermore, Joseph B. Eastman, director of the Office of Defense Transportation, a speaker at the general A.P.I. session November 11 when the tubeless tire was demonstrated, pledged his personal investigation of the possibilities. He promised that the matter would not be passed along for subordinate consideration as had been done other federal agency chiefs.

Experiments with the tubeless-tire discovery, conducted during early stages on a relatively narrow scale, have provided sufficient data to convince its sponsors that the more exhaustive tests will prove equally satisfactory.

Background of the tubeless-tire discovery, an account of discouraging refusal of several government agencies to consider the rubber-conservation possibilities and a factual disclosure of successful experiments were laid before the PIWC and the A.P.I. by Victor F. Barnett, associate editor of the Tulsa Tribune and chairman of the Tulsa war transportation committee. He related how John B. McGay, Tulsa, copartner of the Macnick Co., and discoverer of the tubeless tire, had received discouraging replies to letters explaining the development to the War Production Board, Office of Price Administration and indirectly from the rubber director's office.

Oil men at the Chicago meetings were told that tubeless tires have been operated in experimental service up to 12,000 miles, although it was admitted that the operating conditions were not as severe as might be encountered on proving grounds. The extensive testing program launched by oil companies at the request of the PIWC will cover the entire range of service conditions and will remove any possible doubts as to its feasibility on a national scale.

Mr. McGay demonstrated the comparatively simple conversion of tires to the tubeless installation. The only new equipment necessary is a rubber washer and truck valve core. The truck valve is installed through the regular passenger-car wheel insert, air-sealed by means of two nuts and the washer and the tubeless tire inflated to the desired pressure. The discovery, Mr. McGay declared, is serviceable on any drop-center rim and has been proven satisfactory on the largest passenger-car tires. (See p. 27, The Oil and Gas Journal, November 5, 1942.)

W. S. Farish, president of the Standard Oil Co. (New Jersey) and a member of the PIWC, was first to propose a thorough exploration of the discovery. His motion before the war council to subject the discovery to rigorous service tests was adopted. Earlier, Mr. Barnett explained that several Mid-Continent oil companies had conducted experiments on a limited scale either with company vehicles or private automobile of executives.

After outlining previous correspondence with government agencies, Mr. Barnett declared that one letter from Robert S. Betten, chief, tire-rationing branch, Office of Price Administration, "must remain a classic of misunderstanding whenever or wherever such symposiums are collected."

"Since writing you previously," Mr. Betten wrote Mr. McGay, "our technical advisers have agreed that in certain instances it is possible to place a passenger-car tire on a drop-center rim without the use of a tube. However, they also maintain that because of the type of tire construction at the present time, this method as a general procedure is not possible.

"The skim coat of rubber on the inside ply of fabric on most tires is not heavy enough to stop air seepage. Consequently, unless material changes were made in the present method of tire construction this program could not be adopted at this time.

"Many tire companies have been making tests for quite some time and they are fully conversant with the possibilities expressed by you, but due to the rubber shortage it is not advisable to make these changes."

This reply spurred Mr. McGay to greater efforts, Mr. Barnett related, because amelioration of the rubber shortage was the one problem at which his discovery was aimed.

An estimate was made that tubes now in service on the nation's 27,000,000 passenger cars and in the hands of the manufacturers and dealers contain 277,500 tons of high-grade rubber. Tubes, Mr. Barnett declared, contain about 68 per cent crude rubber and, therefore, are superior for reclaiming than the miscellaneous material now undergoing reprocessing.

"Conservatively," Mr. Barnett said, "it looks like there is enough rubber created by the universal adoption of this plan to see the country well past the peak of production of synthetic rubber, even if that program is delayed somewhat by interruptions not now in sight.

"This is so," he continued, "because a considerable part of the nation's current stockpile of raw rubber has been allocated to the future manufacture of inner tubes for passenger cars used by war workers and the Army and Navy and this allocation now becomes unnecessary and this rubber can go into the stockpile for casings.

"This is so," Mr. Barnett concluded, "because a considerable part of the upcoming synthetic production naturally has been set aside mentally for the production of rubber for inner tubes and this now becomes unnecessary and that production can be guided into casings."

Glen R. Ames, Tulsa, district manager of marketing for Phillips Petroleum Co., points to a tubeless tire which has given several thousand miles of satisfactory service

STATE CAPITALS...

TEXAS

THE RAILROAD COMMISSION may be asked to modify its per-well per-day method of allocating production in the North Permian basin fields as result of an engineering conference last week at Fort Worth. The North Basin Pools Engineering Committee, headed by V. E. Cottingham, embraces the Wasson, Slaughter, Seminole, and Dean pools. The Ownby and Waples-Platter areas of Yoakum County were admitted to the committee representation.

Four proposals were discussed. They were: (1) Adoption of a lease basis of operation. (2) Per-well allowable on a monthly basis with no well permitted to produce more than 3 days' allowable in any 24-hour period. (3) Production unit basis with all wells connected to a common tank battery. (4) Miscellaneous modifications of the present system.

R. U. Fitting of Midland, Shell Oil Co., Inc., was elected secretary-treasurer of the engineering committee, succeeding Alden S. Donnelly, Honolulu Oil Corp.

R. S. Dewey, Midland, Humble Oil & Refining Co., succeeds R. S. Christie, formerly with Amerada Petroleum Corp., as a committee member. Other members of the advisory committee are: Messrs. Donnelly and Fitting; S. L. McDowell, Dallas, American Liberty Oil Co.; R. R. Porterfield, Midland, Devonian Oil Co.; C. D. Vertrees, Midland, Continental Oil Co., and A. E. Will'g Fort Worth, Texas Co.

TEXAS CRUDE oil should now be bringing $1.68 per barrel, if price indexes are considered. Beauford H. Jester, newest member of the Texas Railroad Commission, declared last week in Midland, Tex., where he spoke at an Armistice Day celebration.

He said, in part: "Leon Henderson, OPA administrator, although sincere in his desire to keep down the price of petroleum products, is overlooking the fact that when the inevitable oil shortage comes to pass there will be a sharp and sudden rise in prices. . . . The solution is to increase the price of oil now to encourage wildcatting and field drilling and thus build up the nation's crude-oil reserves against the shortage expected to come within the next 3 years."

CALIFORNIA

A SUBCOMMITTEE on joint use of facilities for the production division of the oil industry has been appointed in District 5. L. L. Aubert is chairman. Committeemen being notified of their appointment by E. E. Pyles, chairman of the District 5 production committee, at the request of William F. Humphrey, general chairman for the district.

Purpose of the committee is to work out means by which both material and manpower can be conserved by the oil industry in view of present and prospective shortages of both. Members were nominated by the district general committee at the request of Deputy Coordinator R. K. Davies.

In addition to Mr. Aubert, who is president of the Bankline Oil Co., other members of the committee on the joint use of facilities for District 5 are: H. T. Wyatt, production manager, Shell Oil Co., Inc.; F. S. Bryant, assistant to the president, Standard Oil Co. of California; A. C. Rubel, vice president, Union Oil Co.; L. C. Decius, vice president, Tide Water Associated Oil Co.; B. E. Parsons, vice president, General Petroleum Corp.; W. M. Keck, Jr., vice president, Superior Oil Co.; Ross McCollum, president, National Oil Co., and R. D. Montgomery, manager of exploitation, Richfield Oil Corp.

OKLAHOMA

WALKER T. POUND, secretary of the Corporation Commission, is scheduled to succeed Joe J. O'Laughlin as chief conservation officer December 1, it was announced in Oklahoma City last week. Reford Bond, commission chairman, and Ray O. Weems, member, confirmed reports of the change in chief conservation officer. William J. Armstrong, the third commission member and previously chief conservation officer, was not advised of the majority decision until it had been made.

Mr. O'Laughlin became chief conservation officer 2 years ago when Mr. Armstrong was elected to the commission. Previously he had been assistant supervisor of the conservation division.

KANSAS

THE REGULAR proration hearing at which evidence will be received for the December allowable order has been called at 2 p.m., November 24, Allis Hotel, Wichita, Kans. Purchasers are instructed to submit their demand calculations prior to the meeting.

NEW MEXICO

FIFTY PRODUCERS, responding to a call from Gov. John E. Miles for a general discussion of petroleum prospects for the state, last week at Santa Fe heard suggestions that additional markets on the Pacific Coast may be the solution to New Mexico's problem. The suggestion came originally from Robert E. Allen, assistant deputy petroleum coordinator, in response to complaints of New Mexico producers that their outlets have been virtually plugged by submarine activity in the Gulf of Mexico and Atlantic shipping lanes.

Governor Miles, who termed the depletion of known reserves as serious, expressed belief that some incentive would be necessary to encourage wildcat drilling operations.

Two Appointees Round Out OPC Marketing Division Staff

WASHINGTON, D. C. — Appointment of two new section heads in the Marketing Division of OPC just rounds out the personnel for the reorganized section.

New appointees are John H. Dockendorff, fuel-oil section chief, and Hamilton H. Wende, head of the newly created facilities section.

Mr. Dockendorff on leave from T. A. D. Jones & Co., New Haven, Conn., wholesale fuel-oil marketers, has had 20 years' experience in the business, and has been with the Jones company for 8 years. In his new position he takes over the duties of Ned Foulds, now devoting full time to industrial fuel-oil conservation problems.

Mr. Wende, a native of Buffalo, N. Y., comes to OPC after 8 years as manager of the Buffalo district for the Texas Co. Prior to that he was president of the Goodyear-Wende Oil Corp., a company he was instrumental in organizing in 1920. He served during World War I as a first lieutenant in the Gasoline and Oil Branch, Office of the Chief Quartermaster.

At OPC, Mr. Wende will handle service-station, bulk-plant, and manpower-conservation problems, as well as assisting in programming the part the Marketing Division will play in the joint use of oil-industry facilities.

Texas Panhandle Refiners Assigned 74-Cent Fuel Price

WASHINGTON, D. C.—Office of Price Administration has set a ceiling of 74 cents per barrel for No. 6 fuel oil for all Texas Panhandle refineries, thus bringing into line the maximum prices of two refineries in the area which had a 69-cent ceiling during the base period prior to October 15.

The new price is contained in Amendment 43 to Revised Price Schedule 88, and applies to bulk shipments in tank cars and tank transport. Refineries in the area are located at Amarillo, Borger, Dumas, Pampa, Shamrock and Sunray, Tex.

Order Bans Use of Fuel Oil In Heating Large Buildings

WASHINGTON, D. C.—First step in a further curtailment program which may result in much more drastic curbs on all consumers of fuel oil in the 30-state rationed area of the East has been taken by Office of Price Administration in announcing what amounts almost to a mandatory conversion order for apartments, office buildings, institutions and similar large structures.

All such buildings (residences are excepted) must convert to fuels other than oil by January 20, in most of the "thermal zones," of else show cause why they did not. It must be demonstrated that the equipment is incapable of conversion.

To insure that rations are not allotted to convertible equipment in the larger buildings, local rationing boards in the limitation area will review all rations issued for heat or hot water to multiple dwellings. In instances where satisfactory proof is not established that conversion is impossible, rations which have been issued for the entire heating year will be revoked and fuel oil allotted only for the period necessary to accomplish conversion.

At the same time, OPA has announced a postponement of the date (from November 1 to November 23) on and after which no person may burn fuel oil unless it has been acquired in exchange for ration coupons or other authorized evidence of compliance with rationing regulations.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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Beware the Loco

Judge J. C. Hunter, president of the Mid-Continent Oil and Gas Association, is opposed to gratuities for exploratory operations as an effective means of reversing the alarming trend toward reduced oil reserves.

Spending a large part of his time at Washington over the past year as the association's representative, the judge has been a leader in placing the oil industry's vast facilities at the disposal of those who are directing the war activities. But he wants no part of any plan which seeks to place exploratory operations under governmental control and direction with subsidies as the bait. He knows that such a program will not find the oil and furthermore he is certain that the entry of government gifts as an integral part of the industry's operations, would mean the beginning of the end of the oil business as a free and an aggressive enterprise.

To illustrate his point the judge, who comes from the western Texas plains and who knows his cattle and horses as well as he does his oil, told the story of the loco weed to an A.P.I. meeting last week. There have been times, due to droughts, he explained, that the grass of the plains is not sufficient to meet the grazing needs. Then the cattle and horses, if they are not closely watched, turn to the loco which has no food value and which acts as a narcotic so the animals lose control of their actions. Unfortunately the locoed animals continue to crave the weed when the pastures become green again and feed supplies are adequate, and in the end they die of exhaustion and starvation.

The danger to which the judge pointed with his story of the weed is obvious. The history of all nations and all economies is that governmental handouts, regardless of how they were given, became the poisonous loco which destroyed that which they were supposed to help. There are numerous current examples in the industrial and agricultural activities of this country of just what this means. Those who have accepted subsidies as an easy way out of a difficult situation or in payment for political support, are shortly governed by them.

The recipients do not react normally to the inevitable ups and downs within their own industry and they plan their course solely for the purpose of securing the maximum in government aid. Initiative and all the other attributes of successful competitive enterprise end. Consumers pay in unwarranted higher prices.

Due largely to the restrictions placed on operations so far in the war, the petroleum industry has found far less oil than it has produced. The war effort has not suffered to date because of the reserve supplies which the industry built up over a period of years. But now even the most obtuse at Washington are beginning to realize the danger of a shortage.

The subsidy plan comes from those who refuse to see any essential connection in operations between the finding of oil and its production after it is found. Rather than pay operators who have been uncovering the world's oil for more than three-quarters of a century an adequate price for the oil they are now producing and thus assure them a commensurate return on any new oil they may find, they are suggesting an impossible program of financing the exploratory operations themselves. In some circles it has even been suggested that the Government carry on geological surveys and wildcat drilling.

The setting up of governmental machinery to carry out a program such as has been outlined would require months to be even partially effective. The all-important war duty of maintaining oil supplies for the United Nations during this crucial period and later is a job that should start today. Given the blue light the oil business is prepared to expand its present operations to a full-scale basis immediately. This of all times is no period to introduce the loco in the operations of this industry.

Heavier War Duties Assigned Industry By A.P.I. Speakers

By H. STANLEY NORMAN

A review of the discussions following technical papers at the various group meetings of the A.P.I. is published on Pages 52 and 54. Extended excerpts from a paper by Max B. Miller, chief, equipment procurement section, OPC Refining Division, on "Refinery Construction in Wartime" starts on Page 51.

HEAVIER war duties were assigned the oil industry directly or by inference last week at the final sessions of the annual American Petroleum Institute meeting in Chicago, Ill. But oil men attending the conclave returned to their individual spheres of operations with assurance that their sacrifices have produced results and more hopeful that certain fundamental corrections in regulations will be modified in the near future.

The industry was assured that minimum refinery runs of 3,800,000 bbl. daily would be required to meet the demands for war fuels and other hydrocarbons in the last part of 1943, including 100-octane gasoline, toluene and butadiene.

Recommendations have been made by all concerned agencies to the War Production Board for an increase in the capacity for producing 100-octane gasoline. The new production goal is a military secret but the over-all program is to be raised nearly 30 per cent, if the WPB can be influenced to allocate the necessary equipment.

The outlook for drilling operations is circumscribed by critical material shortages but a minimum of 16,000 new producing wells is assured. Current emphasis by the Production Division, Office of Petroleum Coordinator, is placed on improved methods and expanded secondary-recovery operations appear to have unqualified approval.

Overland Transportation Plans

Plans were outlined for developing overland transportation facilities to make aggregate deliveries of 1,400,000 bbl. daily to the East Coast, involving another "big inch" line paralleling the emergency system now under construction and an intricate pattern of connecting and tributary systems.

The course of manufacturing operations was more clearly charted than most other divisions of the industry. Refiners were told unequivocally by Bruce K. Brown, assistant deputy petroleum coordinator, that "the yield of motor gasoline from crude must go down and stay down."

More substantial reductions may be necessary in some districts than in others, "but," declared Mr. Brown, "so far as I can see it must go lower in all areas than refiners would like to have it.

"It is just as vital," Mr. Brown continued, "that we have enough petroleum products as it is that we waste nothing (manpower, dollars, natural resources, or construction materials) by producing too much.

"The thing greatly to be feared and hence to be avoided at all costs is the imposition from without the industry of a hard-boiled attitude which lacks realism because it does not appreciate the technological limitations which the refining industry must meet because of the character of its raw material.

"Crude oil must be run in the last quarter of 1943 in excess of 3,800,000 bbl. per day. Much of this crude oil must be run in the refineries producing aviation gasoline, toluene, and butadiene and the balance must be run in refineries best adapted to serve the localities requiring the other petroleum products.

"This figure of more than 3,800,000 bbl. is a far different figure than has been reached at various times by various authorities but it at least has the merit of an objective treatment based on cold-blooded requirements figures and factual data on the yields anticipated of the war products required. It will be noted that in making the computation we have treated the war products as main products rather than byproducts and we have assurance that industry and the general public can and will get along on the motor gasoline, lubricants and other civilian and industrial products which we have treated as byproducts."

More than 2,200 registered at the meeting, a substantial reduction from previous recent years but larger than anticipated by many A.P.I. attaches. Decision on when and where the mid-year and annual meetings of the Institute will be held in 1943 was referred to the executive committee.

All officers of the Institute were reelected. They are William R. Boyd, Jr., president; George A. Hill, Jr., president of the Houston Oil Co., Houston, Tex., vice president for production; J. Howard Pew, president of Sun Oil Co., Philadelphia, Pa., vice president for refining; E. V. Weber, president of Eureka Oil Co., Cincinnati, Ohio, vice president for marketing; Otto D. Donnell, president of Ohio Oil Co., Findlay, Ohio, treasurer, and Lacey Walker, New York, secretary and assistant treasurer.

High commendation was accorded the industry in address prepared by Coordinator Harold Ickes for its record in the production of 100-octane gasoline.

"The job which has been done with 100-octane by the refinery experts of our staff and of the oil industry," declared Mr. Ickes, "is one of the most amazing things I have ever witnessed. It is almost unbelievable. They have virtually squeezed it out of a hat."

Mr. Ickes' paper, read at the A.P.I. general session November 11 by W. Alton Jones, president of Cities Service Oil Co., dealt largely with a review of the accomplishments which, he said, were made possible by the cooperative relation between the oil industry and Government. He explained that neither OPC nor the industry were happy over the necessary "unitization" of operations but said that it is "an inescapable consequence of the shortages of materials and manpower which has been created."

Small Units Concern Ickes

The coordinator asked the entire industry to prevent all casualties within its ranks as far as possible and declared that it was to the interest of all to maintain units, irrespective of size, in a functional condition.

Accomplishments of the transportation mediums in meeting the East Coast shortage was outlined by Joseph B. Eastman, director of the Office of Defense Transportation, at the night general session November 11. He related the close contact maintained between his office and the entire railroad transportation picture. Through coordination of tank cars and a permit system, Mr. Eastman said that petroleum movement through the Great Lakes and the New York State Barge Canal had been increased to a current rate of 70,000 bbl. daily. Movement up the Mississippi and Ohio rivers to Pittsburgh, he added, is now about 50,000 bbl. daily. Conversion of 130 dry-cargo barges is under way in order to move petroleum on the inland waterways or in Atlantic waters.

Current forecasts of demand versus supply of critical materials for the first quarter of 1943 indicate the existence of very substantial shortages, the A.P.I. Division of Production was told by Greer W. Orton, OPC director of materials.

"The production branch of the oil industry," he declared, "is not so directly engaged in war-plant construction as are other branches. Most of the war-plant construction is more directly related to refining and to transportation. However, action in this connection taken recently by the War Production Board might be of interest, since it foreshadows the type of reception that will be given future project applications for new construction requiring the use of critical materials."

A Facilities Clearance Board and a Facilities Review Committee have been created by WPB, Mr. Orton said. Their functions will be to review projects already approved to determine

J. Edgar Pew Misses First Annual Institute Meeting

Absentees at last week's annual meeting of the American Petroleum Institute in Chicago included J. Edgar Pew, second president of the association and vice president of Sun Oil Co. Previous to this year, Mr. Pew had an unbroken attendance record at annual meetings of the Institute.

Mr. Pew fostered and championed the Institute's standardization program through its formulative years and was chiefly responsible for winning its acceptance by operators and manufacturers. Value of standardization was attested at the A.P.I. meeting by numerous references to its important relation to the war program and material shortages.

whether or not authorizations should be withdrawn and to consider all new applications.

Mr. Orton said that a new M-68 order will be issued in the near future and that it would provide for selective drilling. He reviewed the tubular-inventory plan and pointed out that redistribution is the only means through which certain operations will be possible.

New discoveries and additional development must supply 400,000 bbl. of crude daily in 1943; about 800,000 bbl. daily in 1944; around 1,200,000 bbl. daily in 1945, and 1,600,000 bbl. in 1946 if the current production rate of 4,000,000 bbl. is maintained. This conclusion was reached by William B. Heroy, OPC director of reserves, in his address before the Production Division. Projected requirements from new discoveries and extended development were predicated on a composite-decline curve, showing existing fields will fall to about 90 per cent of current output in 1943; 81 per cent in 1944, and 69 per cent in 1945. The indicated need for 400,000 bbl. daily of new production each year in order to maintain present output charts the task ahead for the exploration and producing branch of the industry, Hr. Heroy declared.

The final session of the A.P.I. meeting November 12 was devoted to the OPC staff members headed by Deputy Coordinator Ralph K. Davies, directors of several divisions were introduced and each presented a brief outline of the functions of his department.

Forty-Eight Elected to Board

MEMBERS of the A.P.I. elected 48 to the board of directors, and the board itself elected 11 directors. The executive and membership committees of the board, and the Institute's American Petroleum Industries Committee also were reelected.

The 48 members of the board, nominated by the board of councillors and elected by the membership, are:

Production group.—Pacific Coast: Dana Hogan, Hogan Petroleum Co.; R. C. Stoner, Standard Oil Co. of California; and W. C. Whaley, Barnsdall Oil Co. *Central United States:* J. S. Bridwell, Bridwell Oil Co.; Amon Carter, Star Telegram; E. DeGolyer; H. L. Hunt, Hunt Oil Co.; C. P. McGaha, Fain & McGaha; E. H. Salrin, Tide Water Associated Oil Co.; and E. L. Smith, Dallas. *Eastern United States:* O. D. Donnell, Ohio Oil Co., and F. A. Leovy, Gulf Oil Corp.

Refining group.—Pacific Coast: S. Belither, Shell Oil Co., Inc., and W. L. Stewart, Union Oil Co. of California. *Central United States:* C. M. Boggs, Kanotex Refining Co.; C. L. Henderson, Vickers Petroleum Co.; and Roy B. Jones, Panhandle Producing & Refining Co. *Eastern United States:* Paul G. Blazer, Ashland Refining Co.; Harry Logan, United Refining Co.; and Charles L. Suhr, Pennzoil Co.

Marketing Group

Marketing group.—Pacific Coast: Reese H. Taylor, Union Oil Co. of California. *Central United States:* K. S. Adams, Phillips Petroleum Co.; B. L. Majewski, Deep Rock Oil Corp.; and W. G. Skelly, Skelly Oil Co. *Eastern United States:* C. E. Arnott, Socony-Vacuum Oil Co., Inc.; W. V. Hartmann, Gulf Refining Co.; and W. E. Smith, Standard Oil Co. (Kentucky).

Transportation group.—Pipe lines: E. J. Henry, Atlantic Refining Co. and Harry Moreland, Great Lakes Pipe Line Co. *Tank cars:* L. J. Drake, Union Tank Car Co.

Supply group.—Guy Thompson, Bethlehem Supply Co.; Ferd Spang, Spang & Co.; and A. E. Walker, National Supply Co.

Natural-gas group.—J. D. Creveling, Panhandle Eastern Pipe Line Co.

Natural-gasoline group.—W. K. Warren, Warren Petroleum Corp.

At-large group.—J. A. Brown, Socony-Vacuum Oil Co.; Frank Buttram, Buttram Petroleum Co.; Jacob France, Mid-Continent Petroleum Corp.; Wirt Franklin, Franklin Petroleum Corp.; H. D. Frueauff, Cities Service Co.; S. A. Guiberson, Jr., Guiberson Oil Co.; J. C. Hunter, Mid-Continent Oil and Gas Association; A. C. Mattei, Honolulu Oil Corp.; A. W. Peake, Standard Oil Co. (Indiana); Charles F. Roeser, Roeser & Pendleton; R. van der Woude, Shell Union Oil Corp.; Earle Webb, Ethyl Gasoline Corp.; and Eric V. Weber, Eureka Oil Co.

Forty-two of the directors were reelected. The others replaced 1942 members, as follows: Mr. Whaley succeeds R. A. Broomfield; Mr. Stoner, L. P. St. Clair; Mr. Tompson, J. A. Crawford; Mr. Spang, W. L. Childs (deceased); Mr. Peake, V. J. Barkdull; and M. Mattei, William N. Davis.

Elected by Board

The 11 members elected by the board are: William Bell, Bell Brothers, Robinson, Ill.; Arthur F. Corwin, Socony-Vacuum Oil Co., Inc.; H. R. Gallagher, Woodside, Calif.; H. N. Greis, Deep Rock Oil Corp.; Walter S. Hallanan, Plymouth Oil Co.; Lindsay Hanna, Standard Oil Co. of California; Ralph B. Lloyd, Lloyd Corp.; Parker Melvin, Towne-Melvin Oil Co.; R. W. McDowell, Mid-Continent Petroleum Corp.; Henry D. Moyle, Wasatch Refining Co.; and Robert E. Wilson, Pan American Petroleum & Transport Co.

Five members were reelected. Those elected to succeed others are: Mr. Hanna, to succeed Ralph K. Davies; Mr. Wilson, J. D. Collett (deceased); Mr. Corwin, to fill the unexpired term of E. R. Brown (deceased); Mr. Greis, E. H. Moore, resigned; Mr. Moyle, T. A. Dines, resigned; and Mr. Hallanan, Ralph T. Zook, resigned.

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Construction Machinery Placed Under Limitation

WASHINGTON, D. C.—Oil operators' activities, at least insofar as the purchase and use of construction machinery and equipment (including bulldozers, cranes, ditchers, etc.), have been restricted by issuance of Limitation Order L-192 of the War Production Board, effective November 15.

Under this order, civilian purchases and use of new construction equipment will be permitted only on WPB order. Some of the equipment listed under this particular order includes:

Angledozers and modifications thereof, bulldozers and modifications thereof; cranes, crawler, mounted power; cranes, tractor mounted power; cranes, rubber tired mounted power; drilling machines, blast hole drills; drilling machines, core drills; drilling machines, rock portable, mounted; graders, self propelled, earth moving; heaters and circulators for tank cars; contractors hoists; asphalt plants; portable pumps, tractor mounted winches, and a number of other pieces.

Mud jacks, bituminous heating kettles, certain portable electric motor pumps, and a number of other similar pieces of equipment may be purchased and used under a provision lifting the restriction on resale, rental and use of such equipment.

Certain items are made available only to the military forces, among them guy and stiff-leg derricks, dredges and equipment, portable well-drilling machines, contractors' hoists, and asphalt plants, except those of portable travel-mix type.

Production and Refining Divisions Designate General Committeemen

GENERAL committees for 1943 of the American Petroleum Institute's Divisions of Production and Refining were elected.

Twenty members of each general committee were elected by the division members and five were appointed by William R. Boyd, Jr., president of the Institute. The new committees are:

Production Division: L. E. Barrows, Texas Co.; P. H. Bohart, Gulf Oil Corp.; C. P. Dimit, Phillips Petroleum Co.; F. E. Heath, Sun Oil Co.; J. E. Howell, Lion Oil Refining Co.; M. J. Kirwan, Cities Service Oil Co.; C. H. Kountz, Sinclair Refining Co.; R. W. McIlvain, Pure Oil Co.; J. R. McWilliams, Carter Oil Co., and R. D. Montgomery, Richfield Oil Corp.

Also, H. S. Moss, H. S. Moss Petroleum Co.; W. M. O'Connor, Atlantic Refining Co.; B. E. Parsons, General Petroleum Corp. of California; Earl Porter, Amerada Petroleum Corp.; F. O. Prior, Stanolind Oil & Gas Co.; D. T. Ring, Preston Oil Co.; A. C. Rubel, Union Oil Co. of California; J. R. Suman, Humble Oil & Refining Co.; T. E. Swigart, Shell Pipe Line Corp., and H. T. Wyatt, Shell Oil Co., Inc.

Appointed by the president were: E. DeGolyer, DeGolyer, MacNaughton & McGhee; O. D. Donnell, Ohio Oil Co.; John M. Lovejoy, Seaboard Oil Co. of Delaware; J. Edgar Pew, Sun Oil Co., and R. C. Stoner, Standard Oil Co. of California.

Refining Division: C. R. Barton, Tide Water Associated Oil Co.; W. F. Burt, Socony-Vacuum Oil Co., Inc.; E. D. Cumming, Shell Oil Co., Inc.; A. D. David, Bradford Penn Refining Co.; R. G. Follis, Standard Oil Co. of California; M. Halpern, Texas Co.; G. W. Hanneken, Standard Oil Co. (Ohio); A. M. Kelley, Richfield Oil Corp.; W. W. Lowe, Cities Service Oil Co., and Walter Miller, Continental Oil Co.

Also, W. R. Moody, Deep Rock Oil Corp.; H. D. Moyle, Wasatch Oil Refining Co.; G. G. Oberfell, Phillips Petroleum Co.; M. G. Paulus, Standard Oil Co. (Indiana); A. E. Pew, Jr., Sun Oil Co.; W. A. Slater, Gulf Oil Corp.; C. F. Smith, Standard Oil Co. of New Jersey; G. H. Taber, Jr., Sinclair Refining Co.; C. B. Watson, Pure Oil Co., and W. S. Zehrung, Pennzoil Co.

Appointed by the president were: Paul G. Blazer, Ashland Refining Co.; C. L. Henderson, Vickers Petroleum Co.; E. J. Henry, Atlantic Refining Co.; R. B. Jones, Panhandle Producing & Refining Co., and W. L. Stewart, Jr., Union Oil Co. of California.

Chairmen of the nominating committees were L. L. Davis for refining and H. S. Moss for production.

Davies Foresees Much Higher War Demand for Oil Products

By RALPH K. DAVIES
Deputy Petroleum Coordinator

At least six highly pertinent points were made by Deputy Coordinator Ralph K. Davies in his address before the annual A.P.I. meeting in Chicago which presage requirements on the petroleum industry. They were:

1. There is every evidence that future petroleum requirements for war will increase heavily from the present level.

2. Both Government and industry agree that something must be done to stimulate exploration and wildcat drilling.

3. No necessity exists for governmental entry into the oil business.

4. Refinery operating schedules are being prepared by OPC.

5. Prompt financial relief for maladjustments in operating schedules is sought by the OPC.

6. Pooling, sharing, combining in operation as a unit represent a necessary stripping for action in time of war.

IN common with all that is American, the petroleum industry has been called to the defense of the nation. Its forces are mobilized, its task is assigned. And colossal is the assignment—the supplying of the oil requirements of America and of her Allies.

How well prepared are we to do this job? Have we the organization, the plant, and the basic resources adequate to the purpose? Have we sufficiently well-defined and well-coordinated plans of operation? Does the industry know what is expected of it? Finally, what of the spirit—the will to do, which animates and propels?

We might first consider the adequacy of our crude resources—oil and gas. Today we are producing crude oil and natural gasoline at the rate of more than 4,000,000 bbl. per day. The experts tell me that while those rates might be increased in certain areas, as on the Gulf Coast, they in general represent the maxima consistent with sound production practice. In certain fields they place a strain upon efficient capacity. When I asked the question as to how long this production could be continued without damage to the properties, I met a somewhat less definite answer. There were a number of qualifications, but, in general. I gained the impression that with a reasonable amount of new drilling we can, perhaps, feel safe with these rates for 2 years. Beyond that the future is not predictable with any confidence.

Supply Curve to Reverse

Two years is a short space of time. Remember the war is now in its third year and who would be so reckless as to base national plans upon the assumption that we have but 2 years more—to say nothing of the postwar problem. But what is more to the point, there is no reason to believe that the present demand represents the requirement of the next 2 years—or the next year for that matter. There is every evidence that the future petroleum requirements for war—direct and indirect—will increase heavily from the present level. So far, the added war demand has been offset by the lessened nonwar, civilian demand, but this is not apt to be the continuing experience.

And in any case note the qualification "with a reasonable amount of drilling." Such confidence as I have as to our ability to obtain the minimum necessary for a drilling program of reasonable proportions is based more on what the industry itself can do than upon anything else. I mean the possibilities of reclamation in the oil fields and the emergency use of existing materials and equipment. I bank principally upon the petroleum industry's ingenuity and inventiveness—its demonstrated capacity in overcoming obstacles, for doing the impossible, for performing the miracle in the crisis. But, let all our figures and our forecasting recognize that we shall be tremendously handicapped in doing the production job by reason of our extremely bad material shortage.

At your meeting a year ago I stressed the fact of the decline in oil reserves. The point was that since 1938 production had exceeded discovery. In some quarters this observation was not well received. Somehow it seemed to be felt that this was something of a reflection upon the good name of an industry which had always more than met its obligations. There ensued some discussion and controversy as to the soundness of the methods by which the figures I had used were obtained. But, I think there is today a ready acceptance of the fact which I stated then. On all sides now I hear the assertion that our reserve position is deteriorating, that something must be done to alter the trend.

Today, I am sure that both government and industry agree that something must be done to stimulate exploration and wildcat drilling. But what? Various proposals have been put forward. The industry advocates price advance as the tried and true method. In certain quarters this general advance is challenged as being unnecessarily expensive and subsidies are proposed instead. These in turn are resisted as inadequate, complicated, and impractical. It has been suggested by some that the Government enter the field and conduct a development program. The practical oil men hold one view and base it largely upon experience. Others strongly disagree.

We in the Office of Petroleum Coordinator for War see no necessity for governmental entry into the oil business. Time enough for that when private industry has failed to discharge adequately its responsibility to the nation. As to the practicality of the subsidy plans that have so far been advanced, we are skeptical though ready to give the fullest consideration to any proposal that promises a reasonable solution. The price incentive, we know, has a history to support it. At the moment I am not prepared to say more than that our office has made a special provision for the study of this price proposal with a view to presenting our position to the price administrator at the earliest possible date. And I am tempted to point out that it is one thing to pass a resolution urging price adjustment and it is something else to be prepared to support a recommendation with the facts and figures that are necessary to prove the case. It is futile, and it could be damaging, to take a stand before being ready to defend it.

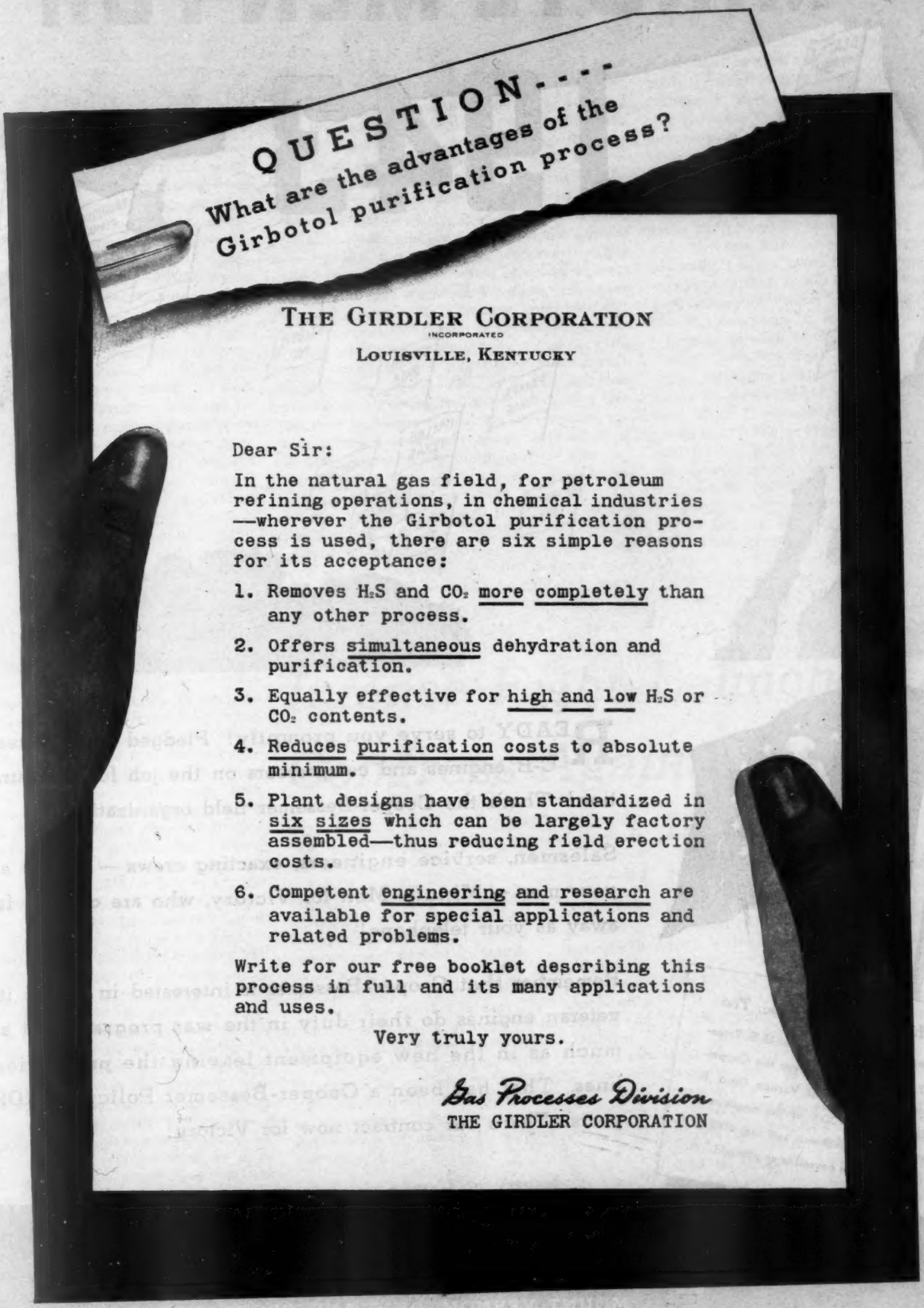
In the past 3 years we drilled in this country an average of 2,963 wildcats per year, and discovered an average of 387,000,000 bbl. in new fields. In the preceding 3 years we drilled fewer wildcats by 22 per cent, yet discovered 78 per cent more oil. It would seem that the bonanza days in oil have pretty well passed.

Exploration Prospects Diminished

It is apparent that the discovery of new prospective areas—likely places to explore for new reserves—has fallen off. This suggests to me the necessity for the industry proceeding now with the development of those good prospects which it has already under control—the acreage that has been acquired heretofore and held for drilling as the needs of the particular company might dictate. The extent of such prospective acreage is not known to me, but it must be considerable. In the light of the condition which now faces us, I believe that the industry should proceed with drilling upon a substantial percentage of these prospects. I am not proposing a blind search for oil but the drilling now of wells which would normally fit into the drilling budget of future years. But it seems very likely that a mere change in development policy on the part of units within the industry would accelerate in an important way the discovery of additional reserves. And I suggest that such a change in policy is warranted in recognition of the national need; that it can be fully justified by management as supporting the national policy—quite aside from the considerations which customarily govern.

Faced with declining reserves and increasing demands it is obviously imperative that production practice be of the most efficient sort. This from the standpoint of the common interest. There is great opportunity for improved over-all operation through the promotion of unit plans within the industry. In production, as in other branches of the industry, there is need for more consolidated operation during the emergency. Savings of the most important kind can be accomplished; savings in material, in manpower, and above all else, in oil itself. The industry has an opportunity during the war to cooperate which is denied it in ordinary times. I believe it has not yet taken full advantage of this fact. I urge the necessity for this course and emphasize with you again the desirability of it from the industry's own long-range point of view.

All that I have said about our crude-oil posi-


QUESTION----
What are the advantages of the Girbotol purification process?
THE GIRDLER CORPORATION
INCORPORATED
LOUISVILLE, KENTUCKY
Dear Sir:
In the natural gas field, for petroleum refining operations, in chemical industries —wherever the Girbotol purification process is used, there are six simple reasons for its acceptance:
1. Removes H_2S and CO_2 more completely than any other process.
2. Offers simultaneous dehydration and purification.
3. Equally effective for high and low H_2S or CO_2 contents.
4. Reduces purification costs to absolute minimum.
5. Plant designs have been standardized in six sizes which can be largely factory assembled—thus reducing field erection costs.
6. Competent engineering and research are available for special applications and related problems.
Write for our free booklet describing this process in full and its many applications and uses.
Very truly yours.
Gas Processes Division
THE GIRDLER CORPORATION

Minute Men at Home, Too

The Minute Man Flag of the U. S. Treasury Department flies over the Cooper-Bessemer plant at Mt. Vernon, Ohio. It signifies that 100% of the employees are buying War Bonds and that 10% of the company's payroll is so pledged.

READY to serve you promptly! Pledged to help keep C-B engines and compressors on the job for the duration! That's the Cooper-Bessemer field organization.

Salesmen, service engineers, exacting crews — they're all *your* men — Minute-Men for Victory, who are only as far away as your telephone!

Remember that Cooper-Bessemer is interested in seeing its veteran engines do their duty in the war program, just as much as in the new equipment leaving the production lines. That has been a Cooper-Bessemer Policy for 109 years. That's our contract now for Victory!

Cooper - Bessemer

MOUNT VERNON, OHIO AND GROVE CITY, PA.

New York Washington Bradford, Pa. Parkersburg, W. Va. Gloucester, Mass.
Houston, Dallas, Greggton, Pampa and Odessa, Texas
Tulsa Shreveport St. Louis Los Angeles Seattle, Wash.

tion applies generally to our natural-gas position.

Turning briefly to refining: I shall not dwell upon the revolutionary changes that are taking place in this branch of the industry. Even seasoned refiners find difficulty in keeping abreast of the wizardry which we see practiced today. How should an ordinarily oil man be expected to operate in this field? But from a general administrative point of view I do want to say this: the demands for refined products under today's conditions—demands which are on the must list—so disrupt normal operation, and transportation shortages so complicate movement, that it is clearly impossible to go along without scheduling from a central source the operating practice of each refinery. The need for this control must be apparent by now to every refiner in the business. All the natural balances have been badly upset. Such a thing as a completely free economy is no longer possible for obvious reasons. Refinery operation must be geared to production, transportation, and war demand programs, and be guided from Washington. Our office is undertaking therefore the preparation of operating schedules designed to meet this emergency situation. We shall do this work in close collaboration with the industry committees and will need all the help we can get from the refiners if we are to succeed in the balancing of supply with current demand and available transportation. I solicit most earnestly your whole-hearted cooperation in this delicate, difficult, and vitally necessary work. We have seen marvelous results achieved in other manufacturing assignments — as the development of 100-octane gasoline, toluene, and rubber — and I know that there is no problem too difficult for our combined forces when we get down to it—together.

Impact of War Severe

Transportation and marketing branches have felt severely the impact of war upon the domestic economy. Tankers have been practically eliminated from the usual services and sent to the fighting fronts. And fortunate it is that our Government had so splendid a fleet of ships upon which to draw in this time of great need. Here again the oil industry with its efficiency in operation qualifies for high honors. The substitution of overland transportation has presented a herculean task, but the companies, with the aid of the railroads, have proved equal to it. Not that it has been possible to supply the full civilian demand upon the East Coast. But considering the magnitude of the job, there is little room for complaint over such restrictions as have been imposed. The large pipe line is finally assured and establishing world records for speed in construction—thanks again to the competence of the petroleum industry leadership and organization. While this will not be enough to meet the ever-increasing demands of the military forces, the new line goes a long way toward solving the problem upon which the petroleum coordinator and the industry have labored from the beginning. The marketing branch has been called upon to make many major adjustments and will be required to make more and drastic ones. The shock has been well absorbed though not without economic casualties. You cannot shift from a peacetime basis to an all-out war standard without violent dislocations in the distributive system.

As these vast changes in normal operation come to pass, it would be a most happy situation if appropriate adjustments might be quickly made in price structures and otherwise, to assure sound financial balance. Much time and effort have been expended to the end that proper compensatory action might follow the physical changes required (in many cases by governmental order) and this, not without result. But it has just not been possible under existing organization of government and industry to meet this problem in more than a semisatisfactory manner. It is the view of Petroleum Coordinator Ickes, as you know, that the oil industry should be maintained in economic health, and you are aware of the various efforts that have been made to obtain relief in circumstances where some compensatory treatment was necessary. Time and again the coordinator has exerted himself to support this principle. It remains our hope that, as the office is required to call upon the oil industry for sharp and far-reaching changes in normal operation, and when this results from the demands of war, we shall be able to see the order followed promptly with appropriate financial relief.

As time passes and the demands of war become more extreme, it is increasingly apparent that the normal competitive order must give way to what we may call unit operation. Whenever any given job can be done with a greater immediate efficiency by consolidation and a subordinating of individual identities, there ceases to be any defensible reason for not so operating. Pooling, sharing, combining in operation as a unit, represent a necessary stripping for action in time of war. The road has been cleared for this legally, and the centralized direction required is provided by the Office of Petroleum Coordinator for War.

Recently, we have organized committees on the joint use of facilities and have called upon the industry to develop through them plans looking to doing more with less—less manpower and less material. As shortages become more critical and more general, this type of action becomes more positively necessary, and plans should be in readiness for installation on short notice. But this intricate and delicate piece of work is undertaken jointly with the industry; again in keeping with the partnership principle which has governed from the start in our relations with the industry.

The extent to which, through these cooperative means, a private enterprise system can be quickly adjusted to meet the demands of the national crisis goes far toward measuring the permanent sufficiency of the system. I am sure that none of us, wedded though we be to the American industrial plan, would want it to survive if in times of peril it were found to be so inflexible as to endanger the life of the nation. I know the personnel of the oil industry to be intensely individualistic, strong-willed, and independent, and I know the prospect I describe is to them not an attractive one. But I know these same men to be patriotic; I know them to have capacity for cooperation, and I know them to have abundant good sense. Therefore, my confidence that the industry will mark up another record to its lasting credit through wholeheartedly supporting the course I have described.

The petroleum industry to date in this war has given an outstandingly creditable account of itself. When I read Secretary Ickes' remarks of yesterday, I felt a very real sense of gratification in noting the high tribute that he paid to the industry which you represent. You must have received his words with pride and satisfaction. I wonder if it may not have occurred to you, as it did to me, that this high praise of an industry by a member of the cabinet was no ordinary incident. Just and well deserved, yes. But something to be remarked, nevertheless, as unusual.

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Intense Fight Launched in Congress Against Rationing

WASHINGTON, D. C.—Opposition to nation-wide gasoline rationing launched a determined fight this week, working through congressional delegations of southern and midwestern states. The fight against rationing took the tangible form of a resolution introduced by Rep. Jed Johnson of Oklahoma calling for a 3 months' postponement beyond December 1. Representative Johnson's resolution asks appointment by the president of a three-man committee to give the proposal further study. Its membership would include one oil-industry representative, one from agriculture and one from general business.

Little chance of favorable action on the Johnson resolution was seen in Washington, however, since the Government is going ahead with plans to begin nation-wide rationing on December 1. Registration of drivers throughout the country was under way.

Jeffers' Plans Proceed

William M. Jeffers, rubber administrator, Monday told the Herald Tribune's forum on current problems in New York that nation-wide gasoline rationing for rubber conservation will be made effective in 2 weeks, indicating that his office is shooting at December 1.

Despite lateness of the concentrated fight, Texas, Kansas, Missouri, Michigan and other congressional delegations marshaled data on transportation requirements in an effort to halt the spread of rationing.

Representative Arends, Illinois, told the House Monday he believed "fair consideration" had not been given the problem.

"This question is more far-reaching than some people think," Mr. Arends said, "and I am pleased that other members of this House are raising their voices."

Nation-wide rationing, said Representative Bennett, Missouri, would be "neither wise nor necessary . . . because we have no shortage of gasoline."

"It is time," suggested Mr. Bennett, "that the people's representatives in Congress should tell some bureaucrats that we have a war to win and that it can't be done by drying up sources of revenue and destroying the morale of the people."

Another Oklahoman, Representative Wickersham, has introduced a resolution providing that gasoline rationing shall not be extended at any time to states or areas in which an adequate supply exists.

In a separate attack on administration policies regarding the oil industry, Rep. Wesley Disney, Tulsa, told the House that "we can only look forward to an oil shortage that will impede the war effort, unless the OPA looks at the matter more realistically and more intelligently than it is now doing.

"The oil men of this nation," he continued, "cannot produce oil for less than cost. Cost of production has gone up more than 35 cents a barrel since 1937. And there has been not attendant rise in prices."

Canadian Operating Supplies Accorded Parity Treatment

WASHINGTON, D. C.—Canadian requirements for oil and petroleum materials will henceforth be considered on the same basis as those of the United States, Coordinator Harold L. Ickes announced November 13.

Details of the plan to handle Canadian requests for materials on a par with similar requests from United States operators were included in a letter addressed to Dominion Oil Crontroller G. R. Cottrell by Deputy Coordinator Ralph K. Davies.

The deputy coordinator wrote:

"On the basis of conferences and in the spirit of the Hyde Park Agreement and the Canadian Proclamation, I now wish to advise you that as respects all forms of consideration given all Canadian petroleum matters by this office, Canada will henceforth rank on precise parity with the United States.

"As soon as the indicated arrangements can be made fully effective the revised procedure for Canadian petroleum will assume the following important objectives:

"1. A closer community of interest between Canada and the United States on all subjects relating to petroleum.

"2. The inclusion of Canadian requirements for petroleum and petroleum materials with those of the United States for applications to, and allocations by, the War Production Board.

"3. The consideration of Canadian Petroleum war plants as integral units of the United States' war program and the scheduling of material deliveries in harmony with that program."

As a result of the closer cooperation between the oil controller of Canada and the Office of Petroleum Coordinator for War, all Canadian applications for materials and for petroleum products will be processed, considered, and appraised just as similar requirements for the United States are processed.

At the same time, provisions have been made for Canadian materials requirements to be transmitted to the OPC by the Canadian oil controller for program determination, just as though they were United States requirements.

K. K. Kreamer Heads Petroleum Electric Power Association

In lieu of the regular annual conference, the Petroleum Electric Power Association held a streamlined 1-day session in Dallas, Tex., November 12. Time was devoted largely to presentation of interassociation papers, and discussions of mutual problems between member-company representatives. Interest of the meeting was centered around means whereby electric utilities can most effectively serve the petroleum industry's war program.

K. K. Kreamer, Houston Lighting & Power Co., Houston, Tex., who was elected president of the Petroleum Electric Power Association, and P. M. Cordell, Texas Electric Service Co., Fort Worth, Tex., new vice president

K. K. Kreamer, Houston Lighting & Power Co., Houston, was elected president of the association for the ensuing year, succeeding H. E. Roberts, of Empire District Electric Co., Joplin, Mo. P. M. Cordell, Texas Electric Service Co., Fort Worth, Tex., is the new vice president.

Newly elected directors for 1942-43 include: Mr. Roberts, E. A. Armstrong, Mr. Cordell, H. C. LeVois, A. M. Young and O. W. Jones. Directors for 1943-44 were named as follows: Mr. Kreamer, W. H. Stueve, Lewis Blalock, R. S. Mauney, R. E. Cope and F. A. Graham.

DEATHS

THOMAS B. JUDGE, 73, treasurer, assistant secretary and director of South Penn Oil Co., Pittsburgh, Pa., for the past 7 years, died last week at an Oil City, Pa., hospital. He had been ill only 2 weeks and his condition was not considered serious. Mr. Judge lived in Pittsburgh, but frequently spent his week ends at Oil City, visiting relatives. He joined South Penn in 1903, in charge of accounting. In 1921 he was transferred to New York City, and in 1935 he became treasurer of the company.

JESSE EMMETT CHANDLER, 53, died at Calgary, Alta., recently. A native Texan, Mr. Chandler started oil drilling in the Burkburnett field in 1915, and was later field superintendent for Manning & Martin, at Denver, Colo., partner in Newell-Chandler, drilling contractors at Calgary, and president of Chandler Drilling Co.

JOHN MORRISON, pioneer oil-well driller of Chelsea, Okla., died last week at Richland, Mo., following a heart attack. He had lived in Chelsea for 35 years. His widow, five sons and one daughter survive.

ALLEN J. HYATT, 61, oil producer of Smethport, Pa., died last week at a hospital in Kane, Pa. He had lived in Smethport since 1900. Death followed a sudden illness suffered immediately prior to his death. He had apparently been in good health. His widow survives.

ERIC H. BUCKNER, 62, South Texas oil operator, banker and cattleman, vice president of Southwest Oil Corp., Corpus Christi, Tex., died last Saturday. Mr. Buckner was a native of Corsicana, Tex., and had lived in Houston for the past 30 years His widow and a daughter survive.

PAUL R. JONES, 66, a director and secretary of Cities Service Oil Co. since its formation in 1910, died in a New York hospital November 10. Death was caused by pneumonia. Mr. Jones was born in Cincinnati, Ohio, and reared in Denver, Colo. He joined the Doherty organization in 1899 as a stenographer and bookkeeper and served as secretary of Lincoln (Neb.) Gas & Electric Co. from 1890 to 1906. With Cities Service he was also chief auditor. He was a director and secretary of Cities Service Power & Light Co., Empire Gas & Fuel Co., director and vice president of Arkansas Natural Gas Corp., Cities Service Oil Co. (Pa.); Federal Light & Traction Co. and other organizations in the oil, natural gas, public-utility and real estate fields.

T. C. SKEEN, 71, died suddenly at his home in St. Louis, Mo., November 9. Until the heart attack which proved fatal, he had apparently been in excellent health. Mr. Skeen had been employed by Columbian Steel Tank Co. since 1929. For several years he was associated with Parkersburg Rig & Reel Co. He moved to St. Louis 35 years ago. He is survived by his widow.

Egloff Endorses Proposal to Maintain Technical Manpower

CHICAGO.—Seeking to remedy the already developing shortage of technically trained men and women for essential war jobs, Dr. Gustav Egloff, president of the American Institute of Chemists, and director of research of Universal Oil Products Co., has sent the following telegram to Sen. Robert A. Taft:

"Heartily agree with your proposed amendment to manpower bill to insure adequate supply of scientifically and technically trained men and women. Suggest three steps in this direction. First, do not draft any scientists or technologists. Retain chemists, chemical engineers and other scientifically trained persons in present wartime-production jobs. Second, continue to graduation education of scientific and technical students, both men and women. Third, encourage more women to study sciences to fit them for technical war jobs. I estimate 75,000 to 100,000 graduate chemists and chemical engineers in United States. War plants already operating, under construction or planned to produce war materials such as aviation gasoline, rubber, and explosives and many other war efforts will require at least double this number, not to mention other services contributing to the war effort such as technical branches of Army and Navy. As director of research of Universal Oil Products Co., I am personally concerned at developing serious shortage of technically trained men and women."

Tank-Car Shipments Rally To Average 768,719 Bbl. Daily

WASHINGTON, D. C.—Tank-car movement of petroleum and petroleum products into the eastern states recovered to an average daily shipment of 768,719 bbl. for the week ended November 7.

Daily shipments were up 15,125 bbl. over the previous week when they averaged 753,594 bbl. Thirty-nine companies loaded 25,145 tank cars to accomplish the daily shipment of 768,719 bbl. of petroleum and products. On the basis of an average of 214 bbl. per car, a total of 5,381,030 bbl. moved eastward during the week.

Socony-Vacuum Officials Cleared in Breach-of-Duty Suit

NEW YORK, N. Y.—An interesting sidelight on the Madison indictment was provided here last week when Supreme Court Justice Felix C. Benvenga dismissed a stockholders suit against present and former officers and directors of Socony-Vacuum Oil Co., Inc. The dismissal absolved the officers and directors of charges of breach of duty in connection with the buying program in which Socony-Vacuum and other companies participated and which was later declared to be in violation of the Sherman antitrust act.

Location of Oil Reserves Big Factor in Supply Deficiency

(Continued from Page 15)

The remainder of the life of the field, which might be as much as 50 years, will show a less rapid decline and a correspondingly less rapid change in years' supply.

In general it may be considered that if a state is withdrawing oil at the rate of more than a thirteenth of its proven reserves, it is overproducing and, as a result, production may be expected to decline in the near future unless it is augmented by discoveries of major importance. In those states in which proration is not effective, the increased production afforded by these discoveries gives only temporarily relief because they are permitted to produce to capacity, causing rather rapid declines.

Based on 1941 output and excluding those states and districts in which production is mainly in the stripper stage, The Oil and Gas Journal's estimates of reserves show that relatively few areas east of California are annually producing less than a thirteenth of their proven reserves. These districts include Colorado, New Mexico, and Texas, except the South and South Central districts.

Discoveries, prospective discoveries and other factors suggest that these are not the only sectors in which increased production can be obtained without violating sound producing principles and each area has been appraised in terms of present production, potential increased production and possibilities now apparent for important discoveries.

Possibility of Increased Supplies

Eastern district.—The eastern district, consisting of the Atlantic seaboard states and exclusive of western New York and western Pennsylvania, requires 644,000 bbl. daily, according to the assumed norm and not only is there no oil produced in this district, but no production is anticipated. Thus, 644,000 bbl. daily has to be imported from other districts.

Appalachian district.—This region, consisting of western New York, western Pennsylvania, eastern Ohio and West Virginia has a normal demand for 148,000 bbl. daily, of which it produced 83,000 bbl. in October 1941 and 82,000 bbl. in October 1942. There was, thus, a small decrease despite drilling stimulated by an increased price for oil. No considerable gain in production can be anticipated from this region.

Reserves of oil in this district as of July 1, 1942, are estimated to be 329,093,000 bbl., which is 10.7 years' supply. The amount of oil now entering the district, namely, 710,000 bbl. daily, including that which passes through to the coastal district will probably have to be increased steadily in the future.

East Central district.—The refinery area, including Michigan, western Ohio and Kentucky, requires 249,000 bbl. daily and produces 77,000 bbl., requiring imports of 172,000 bbl. daily in addition to the 710,000 bbl., which passes through it to the east. Kentucky's output is practically all stripper production, so little increase is likely here. Michigan had an estimated reserve of 78,796,000 bbl. on July 1, or 3.5 years' supply. Production has declined nearly 15 per cent from a high of 69,800 bbl. in June of this year and most comes from a few newly discovered flush fields. Unless new fields are found, which cannot be foreseen, it is possible that Michigan will soon decline to its June 1941 rate of around 40,000 bbl., so that the present deficiency will increase to 192,000 bbl. in the East Central district.

Natural Gas News

WPB Order Bans New Gas Deliveries to All Nonresidential Consumers

WASHINGTON, D. C.—New, drastic controls over deliveries of both natural and manufactured gas have been ordered by War Production Board, accompanied by the warning that more stringent regulations will follow if the situation does not improve. The new restrictions cover both residential and industrial uses, and become effective November 30.

One of the most important curtailments makes nation-wide the previous ban on new deliveries of natural gas to nonresidential users, which previously had been limited to certain states. By this amendment, the states of Louisiana, Texas, Arizona, New Mexico, Montana, Maryland, Utah, and previously unaffected areas in Oklahoma, Arizona, Mississippi and Alabama are brought under control as to new deliveries of natural gas, unless such distribution is specifically authorized by WPB.

Affecting residential consumers is the provision restricting deliveries of all gas-heating equipment, whereas heretofore the prohibition did not affect small unit heaters supplying less than 50 per cent of the heating requirements of the premises.

A third limitation prohibits installation of gas equipment in either residential or nonresidential premises if delivery of gas to such equipment is not permitted under the order.

The schedule of curtailment to be followed by gas companies during anticipated shortages is in general continued but is made more detailed. The purpose of the curtailment schedule is to protect war producers and essential civilian services in time of shortage. Whenever necessary, the WPB director general for operation is authorized to require gas companies to curtail deliveries to residential consumers.

Natural Gasoline

Central Plants Possible for Converting Paraffin Hydrocarbons to War Materials

CHICAGO.—Central isomerization or alkylation plants fed by the production of several natural-gasoline operations are considered a possibility for increasing participation in the manufacture of war materials from paraffin hydrocarbons. This conclusion was reached on the basis of disclosures at a special session here last week of executives and technical men of the Natural Gasoline Association of America held during an interlude in the annual A.P.I. meeting.

The meeting took the form of an "information please" program with a panel of process and construction experts answering written questions submitted by the industry. The moderator of the session was T. R. Goebel, Shell Oil Co., Inc., Houston, Tex., who was assisted by Dr. G. G. Brown, University of Michigan, and C. R. Williams, Chicago Corp., Corpus Christi, Tex. The panel of experts consisted of A. J. L. Hutchinson, Fluor Corp.; Harold Vagtborg, Institute of Gas Technology; E. R. Smoley, V. Mekler and V. O. Bowles, the Lummus Co.; Louis Weiss and Henry Wade, Stearns-Roger Manufacturing Co.; Gustav Egloff, Louis S. Kassel, J. McAfer and J. F. Walter, Universal Oil Products Co.

Presenting the needs of the war program were representatives of the OPC Natural Gas and Natural Gasoline Division, E. Holley Poe, director; P. M. Raigorodsky, assistant director, and James E. Pew, chief of the natural-gasoline section.

The broad question before the meeting was concerned with the best means for stimulating production of the hydrocarbons in the paraffin group most useful in the manufacture of critical war products. With the knowledge that it is one of the chief and most available sources of butane, isobutane and isopentane, the industry was seeking information on the best mechanical and most economic routes to increase that production. There is full realization that many small plants are not equipped to isolate the individual hydrocarbons but might be altered with the addition of a small amount of critical material to make a 40-lb. product which could be split as needed by manufacturers of rubber and aviation fuel. There is also the definite possibility that many plants, with greater facilities and the addition of some equipment, could extract the individual hydrocarbons for marketing as pure raw material for blending or processing to synthetics. Between these two extremes of plant utility are many feasible and practical variations and the entire range was covered in the questions submitted.

Answers of the process experts to these questions and the open forum discussion of them led to several general conclusions of value to the industry. Beginning with the acknowledge fact that isobutane is currently the most critically needed hydrocarbon in the paraffin group due to war demands, it was concluded this demand would increase rather than diminish for several years to come and that there would be a wide market for it in the postwar era. Every effort should be made to increase isobutane yield by improving the yield of total butanes but isomerization plants are not feasible at natural-gasoline plants having a production of less than 50,000 gal. per day.

A STORY OF 18 SQUEEZES IN 2 WORDS . . .

"IMPROVED UNAFLO"

Performance of this retarded oil-well cement in 18 different wells shows how to take the guesswork out of your day-to-day drilling operations.

IT IS NOT alone the spectacular cementing jobs that prove the full value of Unaflo cement, but also its consistent day-to-day performance. Jobs like those reported here have earned for Unaflo its high reputation. The chart gives facts of Unaflo performance in squeezing off salt water and reducing high gas ratio in 18 typical wells.

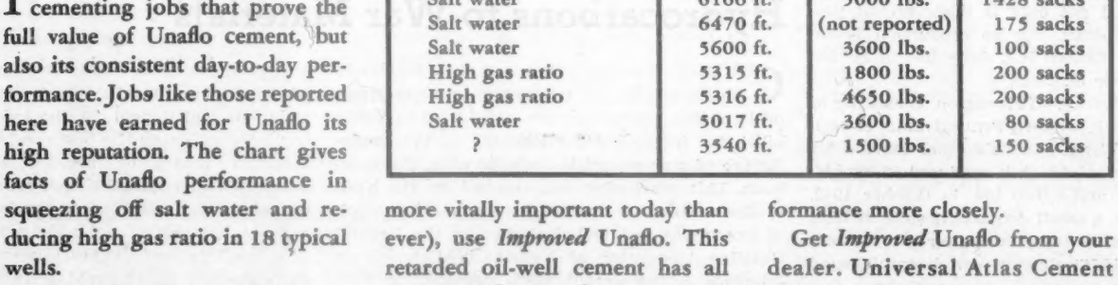
For consistently successful down-the-well performance, specify *Improved* Unaflo. To protect your drilling equipment (and that's more vitally important today than ever), use *Improved* Unaflo. This retarded oil-well cement has all the advantages of the original Unaflo. And it's better because engineers have given it properties that enable you to control its performance more closely.

Get *Improved* Unaflo from your dealer. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Amicable Building, Waco; Oklahoma City; Kansas City; Chicago; Birmingham.

EIGHTEEN SUCCESSFUL SQUEEZE JOBS WITH UNAFLO

Reason for Squeeze	Depth	Pressure	Amount of Unaflo Used
High gas ratio	4560 ft.	4500 lbs.	150 sacks
Salt water	5320 ft.	3000 lbs.	75 sacks
Salt water	7130 ft.	2500 lbs.	50 sacks
Salt water	6750 ft.	3500 lbs.	150 sacks
100% salt water	7640 ft.	3300 lbs.	104 sacks
Salt water	6425 ft.	4500 lbs.	300 sacks
High gas ratio	4400 ft.	1600 lbs.	250 sacks
Water	4785 ft.	2200 lbs.	200 sacks
Salt water	7265 ft.	3300 lbs.	100 sacks
Salt water	3295 ft.	4100 lbs.	150 sacks
Salt water	6650 ft.	3500 lbs.	90 sacks
Salt water	6166 ft.	5000 lbs.	1428 sacks
Salt water	6470 ft.	(not reported)	175 sacks
Salt water	5600 ft.	3600 lbs.	100 sacks
High gas ratio	5315 ft.	1800 lbs.	200 sacks
High gas ratio	5316 ft.	4650 lbs.	200 sacks
Salt water	5017 ft.	3600 lbs.	80 sacks
?	3540 ft.	1500 lbs.	150 sacks

OG-U-30



ENGINEERING *and Operating* SECTION

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Pilot-Plant Study of the Gray Clay Treating Process

The Gray clay treating process for inhibiting gum formation in cracked gasolines was found to permit more economical operations on a refinery scale than in the laboratory. This article describes results obtained in a pilot plant constructed so as to duplicate commercial conditions.

By DR. A. W. COBB* and L. CARLSON†

THE Gray clay treating process[1] constitutes a widely accepted process for improving color and gum stability of cracked gasoline. In recent years the almost universal use of tetraethyl lead and dye in marketed gasoline, coupled with the use of antioxidants, has enabled some refineries to market cracked gasolines without a refining treatment for improvement of color and gum stability. Although it is possible to inhibit a gasoline against excessive deterioration under normal storage conditions, it is often advantageous to use clay treating to lower antioxidant cost and to aid in preventing gum formation. Some of the moderately and highly cracked gasolines, especially from naphthenic type crudes, may not be satisfactorily inhibited against excessive gum formation unless first either acid or clay treated. The difficulties attendant upon acid treating are generally recognized, and the Gray process of vapor phase clay treating of cracked gasolines is almost without competition among alternative methods of treating cracked gasolines.

Laboratory and Pilot-Scale Evaluations

The first commercial Gray process equipment for the catalytic refining of cracked gasoline indicated that plant-scale practice enabled the treatment of a larger amount of gasoline per unit weight of catalyst than was obtainable on small-scale laboratory apparatus with corresponding gasolines. Consequently conversion factors were used in order to project to the expected plant result the laboratory results obtained with a small catalyst bed. This method of evaluation was satisfactory for many ordinary cracked distillates but was not completely informative in all cases.

To provide a more exact method of clay treating evaluation, an apparatus was developed consisting of a clay tower having a clay bed approximately 6 ft. in depth and 1 in. in diameter. With this equipment it was found that clay yields more nearly approaching plant operation were obtainable, and it was therefore concluded, and later investigation proved this correct, that in order to duplicate plant results, the laboratory treater must not only work at the same operating pressure and temperature as the plant commercial unit, but must also work under the same time of contact and superficial vapor velocity conditions as prevail in the plant operation. To fulfill the latter conditions, a long slender clay bed is required for laboratory investigation. This requirement introduces a problem of strictly uniform temperature control throughout the entire length of the chamber. Experimental work which sought to take into account the effect of the fixed gases normally accompanying the gasoline vapors in plant operation could be carried out only with extreme difficulty on laboratory scale. A final variable, which for an ordinary sample evaluation is probably not a serious factor, but which for certain types of experimental work must be taken into consideration, was the question of the effect of the interval between the time the sample is obtained from the cracking plant and the time it is handled in the unit.

On the basis of the experience obtained in these early investigations it became apparent that to fully investigate certain variables of clay treating an experimental unit taking charge vapors directly from a commercial cracking unit would best serve the purpose. Such a unit could be built of sufficient size to render the problem of heat control a less critical factor; the effect of fixed gases could be more readily determined, and the effect, if any, of aging of the gasoline to be treated would be eliminated. In this connection it should be pointed out that Steiniger[2] has reported pilot-scale results on vapor-phase treating of cracked gasoline, although in this case only one clay tower was used which of course precludes direct comparison of two sets of operating conditions without introducing the potential variable of difference in charge stock. The material which follows was obtained in the course of a program of investigation jointly undertaken by the licensor of the Gray clay-treating process and one of its largest users.

Description of Experimental Unit

An experimental pilot plant was installed close to the large-plant cracking equipment, taking vapors from the vapor line leading to one of the plant Gray units. In this way an entirely representative portion of the cracked gasoline and fixed gases was available for the experimental unit. It was also possible to compare directly the plant-scale treating operation with the results on the experimental unit.

The experimental unit consisted of two complete clay treating systems, each having its own

*Pan American Refining Corp.
†Gray Processes Corp.

after-fractionator, condenser, and receiver; the two systems were so arranged that they could be operated in series, in parallel, or singly. An important advantage of the double system and parallel operation provision resided in the fact that when investigating such variables as catalyst, time of contact, etc., it was always possible to compare the effect of the experimental conditions *simultaneously* and *directly* with the effect of standard operating conditions and on precisely the same feed stock. Accurate determination of the effects of individual variables with a single experimental unit is not feasible due to the normal variation in the commercially produced feed to the experimental unit from day to day and from run to run. (The simultaneous operation of a control as above described is somewhat analogous to running a blank in analytical chemistry.)

A flow diagram showing the main features of the installation is given in Fig. 1. The charge vapors, taken from the clay tower inlet under the same pressure and temperature as in the plant system, pass first through a revaporizer (*A*) to counteract heat losses in the entering hot vapor line. Leaving the revaporizer, the vapor stream splits before entering the two clay systems. The clay towers (*B*) and (*B'*) are 10 in. in diameter and of sufficient height to permit the use of a clay bed 14 ft. deep. Therefore, the same throughput in barrels per ton per hour and the same time of contact can be maintained in the experimental unit as in the commercial plant, while also keeping the same superficial vapor velocity in both cases. The clay towers operate essentially adiabatically because the temperature in the surrounding insulation is kept heated to the same temperature as that inside the towers themselves. This is effected by the circulation of hot oil in the tubes which are coiled around the towers between two layers of insulation. It can be seen therefore that the conditions of treating in the experimental pilot plant correspond closely to those in the commercial towers. The vapors pass downward through the clay towers (*B* and *B'*) and thence into fractionator towers (*C* and *C'*). The flow rate of hot vapor through each system is controlled by a ¼-in. valve (*G* or *G'*) in the vapor line leading from the clay tower into the fractionator tower. The pressure in the clay towers is maintained at 250 lb. per sq. in. which is essentially that in the commercial system; whereas the pressure in the fractionator towers is maintained at approximately 200 lb. per sq. in. by means of back-pressure regulators (*H* and *H'*) in the high-pressure gas line leading from both systems. The flow of hot vapors into each clay tower is continuously recorded on a recording flow meter chart. The clay polymer and heavy ends condensing out in the clay towers leave, in liquid form, from the bottom of the tower and pass into receivers where the quantity of bottoms can be measured. The fractionator towers are filled with ½-in. berl saddles to a depth of 8 ft. A coil is located in the bottom of the fractionator towers through which hot oil may be circulated for reboiling. Small Hills-McCanna positive displacement pumps serve to pump reflux to the top of the fractionator towers. Another set of similar pumps serves to pump reflux to the top of the clay towers when desired. The fractionator tower bottoms may be cooled and collected for sampling or for measurement of flow rate or they can be discharged directly into the waste gasoline line leading back to the refinery system. The fractionator overhead is cooled in condensers (*D* and *D'*) and collected in high-pressure receivers (*E* and *E'*). The noncondensable gases pass out of the system through the back-pressure regulators (*H* and *H'*). Usually the contents of the high-pressure receivers are maintained at approximately 160° F. so that gasoline being produced from the subsequent flashing operation will not have an excessively high Reid vapor pressure. The gasoline collected in the high-pressure receivers is partially flashed in passing through a throttling valve into the low-pressure receivers (*F* and *F'*). The pressure in the low-pressure receivers is usually at about 7 or 8 lb. gage. The gas from the low-pressure receivers combines with that from the high-pressure receivers, and the combined gas is measured by orifice meters before being discharged from the system. The gasoline from the low-pressure receivers is metered before being pumped back into the plant-cracking-unit system. The gasoline recovery system will usually show a loss of about 1 to 2 per cent of pentanes and heavier to the gas streams. However, it is believed that this small loss of light ends will not appreciably affect the color and gum-forming properties of the gasoline, which properties are the more important ones in the investigation.

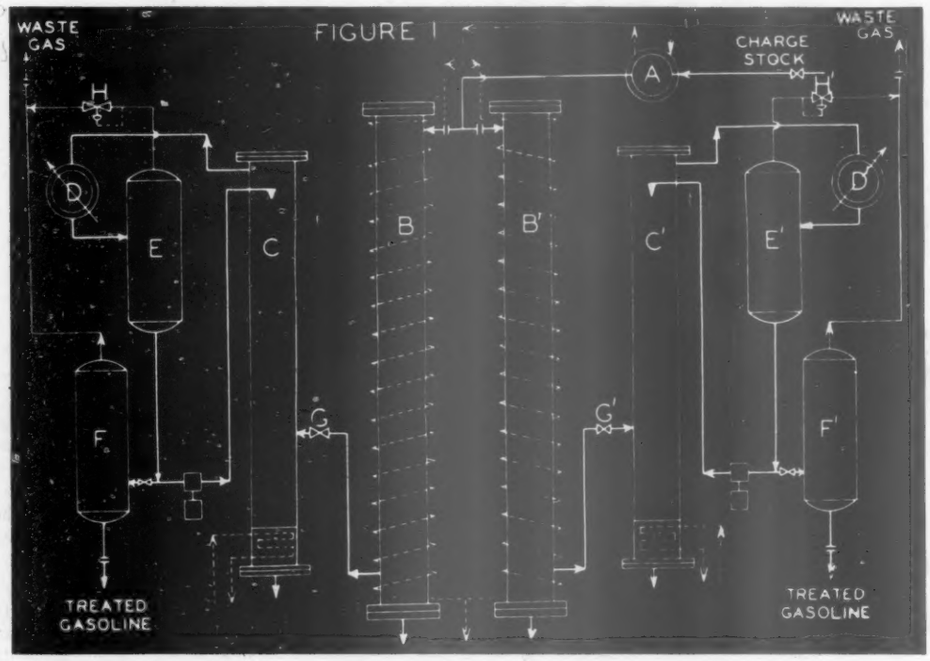

Fig. 1—Flow diagram showing main features of pilot plant

In the operation of the unit, the hot oil to the revaporizer is controlled so that the temperature at the top of the clay bed corresponds to that being maintained in the plant scale equipment. The circulation of hot oil in the coils around the clay towers is maintained so that the differential between the clay-tower insulation temperature and the temperature in the clay bed itself will be zero. The levels held in the various towers are controlled by hand-operated needle valves. The throughput rate is controlled by means of the small needle valve (*G* or *G'*) shown in Fig. 1, between the clay-tower outlet and the fractionator tower. Hand control at this point has given very smooth operation. These valves are kept adjusted so that a steady vapor inlet charge rate is being held at all times, as indicated by the charge meter recording chart. The maximum deviation of flow from average due to momentary fluctuations amounts to about 10 per cent. End point control on the gasoline product is maintained by adjustment of quantity of reflux to the fractionator towers and temperature in the after-fractionator reboilers. The Reid vapor pressure is controlled by adjustment of the amount of cooling in the fractionator overhead coolers (*D* and *D'*), Fig. 1.

Comparison of Pilot-Plant Clay Treating With Commercial Clay Treating

A correlation was made of results obtained by pilot-plant clay treating and those obtained by commercial clay treating while operating with the same kind of clay under essentially the same conditions of temperature, pressure, and time of contact. Average properties of the treated gasoline taken at the same clay age from the pilot and commercial units were measured. The comparison of color was made on the sour product. The copper dish gum comparisons were conducted on the doctor sweetened product in all cases. The comparison of color, copper dish gum, and induction period of clay treated gasoline from the pilot plant with that from the commercial plant is shown in Table 1. The data for the clay life period shown represent an average of at least two or three sets of data in all cases. The average colors of the comparative samples agreed within 1 Saybolt color unit, the copper dish

TABLE 1—COMPARISON OF AVERAGE GASOLINE PROPERTIES

	Commercial unit gasoline		Pilot-plant gasoline	
Comparison No.	1	2	1	2
Crude type	Naphthenic	Naphthenic	Naphthenic	Naphthenic
Clay life period represented (bbl./ton)	3,000-4,000	4,000-5,000	3,000-4,000	4,000-5,000
Average color (Saybolt)	29	29+	30+	30+
Average copper dish gum	*6	*7	*8	*6
Average induction period†	*250	*250	245	225

*Data obtained on doctor sweetened samples. Other data determined on sour stocks.
†Voorhees method see lit. Ref. (2).

gums with 2 mg., and the induction periods within 25 minutes.

In contrast to the direct correlation between pilot-plant and large-scale treating is the performance of a laboratory glass clay-treating apparatus used for some earlier investigations. This apparatus operated at atmospheric pressure and about 300° F. with the rate of throughput in barrels per ton per hour of treated gasoline being about double normal plant rates, but with the vapor velocity lower than normal plant velocities due to the shortness of the clay bed. In this case the copper dish gum of the treated product was at all clay lives considerably higher than plant gasoline and the color of the treated product began to drop from 30+ Saybolt at about 200 bbl. per ton clay life and reached about 23 Saybolt at 600 bbl. per ton.

Comparison of Clay Treated and Untreated Gasoline

In a recent short test run one clay-treating system was filled with a full charge of a standard 30-60 mesh clay while the other clay-treating system remained empty. A comparison of the properties of the gasoline products from the two systems permits a direct comparison between gasoline which has been clay treated and that which has not been treated, the operations being carried out under commercial conditions. Of particular interest in this run was, first, a comparison of the color and the gum stability of the treated and untreated gasoline; second, a comparsion of the octane-number difference between the two gasolines.

Experimental

The general operating data for this run are shown in Table 2. The clay contained in clay treating unit No. 1 had been used for a previous run under essentially the same conditions as maintained during the run described. The treating age of this clay at the beginning of the test run was 509 bbl. per ton. The treating temperature, pressure, and rate closely approximate those used in the commercial Gray towers at this cracking unit. The slightly higher temperature shown for clay treating unit No. 1 is believed largely due to heat of reaction since the heated jacket temperature around the two clay towers was the same. During the first 3 days of the test a paraffinic-type crude was being processed at the cracking unit from which the clay pilot plant takes its charge. During the last 2 days naphthenic-type crude was being processed for a comparison of the gasoline properties. Twenty-four-hour composite samples of gasoline were taken from each system and collected under gas with increments at 4-hour intervals. Two such sets of samples were taken during the processing of paraffinic crude; the other two sets of samples were taken during the processing of naphthenic crude. A portion of each 24-hour composite sample was doctor sweetened in glass using a plant-rejuvenated doctor solution and a solution of sulfur benzene. This sweetening was carried out under an atmosphere of hydrocarbon gas with the use of minimum quantities of doctor solution and sulfur. Samples of both the sour and the sweetened stock were tested for color using the Saybolt colorimeter, copper dish gum[4] and induction period by the Voorhees[3] method. These data are given in Table 3. The initial color of the clay treated gasoline was never lower than 29 Saybolt. The untreated gasoline color was usually 18 or 19 Saybolt.

The copper dish gum of the sour and the sweet samples shown in Table 3 were in most cases very close to the same, showing that essentially no change in copper dish gum had occurred during sweetening. The clay treated gasoline samples in all cases showed much lower copper dish gum than the untreated samples. The copper dish gum of the untreated samples for the last two sets of samples when naphthenic crude was being charged was considerably higher than the copper dish gum on the first two sets of samples when paraffinic-type crude was being charged.

The induction periods of both the sour and sweet stocks from both No. 1 system gasoline which had been clay treated and No. 2 system gasoline which had been given no clay treatment were determined. The induction periods of the sweet gasoline samples were, in all cases, lower than those of the sour gasoline. Evidently some of the natural inhibitors ordinarily present in the gasoline were removed during the sweetening operation. The induction period of all samples in the presence of 0.002 per cent of Du Pont antioxidant No. 17 are also given. Particularly noteworthy is the relatively great inherent stability of the clay treated stocks. Thus, it is seen that the sour-treated gasolines averaged 250 minutes induction period as against 128 minutes for the untreated samples. The sweetened treated samples averaged 171 minutes against 73 minutes for the sweetened untreated samples. Addition of 0.002 per cent of Du Pont No. 17 to the sour treated samples showed an average increase of about 1,000 minutes in induction period as compared to an increase of 355 minutes on the sour untreated samples. The same amount of inhibitor effected an average increase of approximately 390 minutes on the sweetened treated samples as compared with 170 minutes on the sweetened un-

TABLE 4—A.S.T.M. DISTILLATION DATA ON SAMPLES DESCRIBED TABLE 3

Unit No. 1

Set. No.	Clay life B/T	Initial	10%	30%	50%	70%	90%	F.B.P.	Rec.	Loss	Res.
1	787	89	138	192	240	286	356	384	93	6	1
2	851	97	150	202	245	278	356	380	94	5	1
3	1,101	96	148	198	245	290	354	390	96	3	1
4	1,257	94	144	207	246	291	354	390	96	3	1

Unit No. 2

Set No.	Initial	10%	30%	50%	70%	90%	F.B.P.	Rec.	Loss	Res.
1	93	140	198	244	288	361	388	93	6	1
2	92	144	197	240	282	343	378	95	4	1
3	100	154	196	243	282	354	395	95	4	1
4	101	148	202	246	286	354	398	96	3	1

TABLE 5—OCTANE-NUMBER COMPARISONS CLAY TREATED AND UNTREATED GASOLINES

Sample No.	Crude type	Clay life at No. 1 unit (Bbl./ton)	Gasoline properties: °A.P.I. *1	°A.P.I. *2	Reid vapor pressure 1	Reid vapor pressure 2
1	Paraffinic	673	59.7	....	11.0	11.0
2	Paraffinic	801	59.8	61.5	9.1	9.1
3	Naphthenic	1,051	59.5	58.8	10.3	10.2
4	Naphthenic	1,175	59.2	59.1	9.4	9.4

OCTANE NUMBERS

Sample No.	CFR-M 1	CFR-M 2	CFR-M +1 cc. TEL 1	CFR-M +1 cc. TEL 2	CFR-M +2 cc. TEL 1	CFR-M +2 cc. TEL 2	CFR-M +3 cc. TEL 1	CFR-M +3 cc. TEL 2
1	68.9	68.7	75.5	75.5	....	78.2	79.7	79.7
2	68.9	68.7	75.7	75.5	77.8	77.7	79.6	79.7
3	72.6	72.4	78.1	77.9	80.5	80.4	81.7	81.6
4	72.4	72.2	78.1	77.9	80.5	80.4	81.7	81.5

*1 = clay treated. 2 = not clay treated.

TABLE 2—GENERAL CONDITIONS OF CLAY TREATING FOR COMPARISON OF CLAY TREATED AND UNTREATED GASOLINE

	Unit No. 1	Unit No. 2
Weight of 30-60 mesh clay charge	276 lb.	none
Volume of clay charge	7.64 cu. ft.	none
Treating age of clay at beginning of test	509 bbl./ton	....
Average temperature in clay tower	445° F.	440° F.
Average pressure in clay tower	247 lb./sq. in.	249 lb./sq. in.
Average treating rate, bbl./ton/hour	5.1	....
Length of run	146 hr.	146 hr.
Total stabilized gasoline treated	103 bbl.	110 bbl.
Total fixed gases passing through towers cu. ft. at 60° F. and 14.7 lb. abs.	136,000	137,000

TABLE 3—COMPARISON OF PROPERTIES OF CLAY TREATED AND UNTREATED GASOLINE

Clay life Bbl./ton	Copper dish gum (Mg.) Sour *1	Sour *2	Sweet 1	Sweet 2	Induction period Sour 1	Sour 2	Sweet 1	Sweet 2	Induction period + 0.002% Du P. #17 Sour 1	Sour 2	Sweet 1	Sweet 2	Induction period 0.005% Du P #17 Sweet — 2
787	4	14	6	14	305	120	165	60	>1,440	440	560	265	660
851	3	17	5	12	245	135	185	70	>1,300	515	540	275	505
1,101	4	61	4	50	240	95	165	85	990	510	540	200	645
1,257	9	38	10	39	210	160	170	75	1,200	465	590	230	515

*1 = clay treatment. 2 = no clay treatment.

treated samples. These data indicate not only the improvement in gum stability effected by clay treatment but also the improvement in response to inhibitors. A.S.T.M. distillations were also run on each of the composite gasoline samples taken for test purposes. These data, shown in Table 4, indicate that the gasoline taken from unit No. 2 containing no clay was of slightly higher final boiling point. This difference was not sufficient to invalidate the comparisons of gasoline properties shown in Table 3.

Octane-number comparisons were made on samples of gasoline taken from each clay treating unit. The samples were taken as 4 to 5-hour composites from the high-pressure receivers while operating at 200 lb. gage pressure and about 100° F. in order to retain as much as possible of the butane and heavier in the samples. Four such sets of samples were taken. The pairs of treated and untreated samples were depropanized in a 4-ft. Stedman column to similar Reid vapor pressures. The octane-number determinations were made by the standard A.S.T.M. method using a four-bowl carburetor so that a direct comparison between the pairs of samples could be made with least possible inaccuracy. Lead susceptibility was determined using 1, 2, and 3 cc. of lead tetraethyl in gasoline from both treating units, with the octane determinations being made by the A.S.T.M method. Data shown in Table 5 indicate that within the limits of experimental error, the octane numbers of the samples taken from the system containing no clay were identical with those taken from the system containing clay. Reid vapor pressures of each pair of samples checked closely. It is evident from these results that normal clay treatment for gum and color improvement has no measurable deleterious effect on the octane number of gasoline.

Summary

From the results herein it will be seen that a pilot plant has been developed which duplicates commercial conditions of Gray treating very well The results on this equipment are believed transferable directly to full-scale commercial operations. A direct comparison of clay-treated and untreated gasolines under commercial conditions has been effected which indicates not only the large improvement in gasoline quality associated with Gray treating but also the absence of any deleterious effect on octane number of product in the treating operation.

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Repressuring in Lime Proves Successful in Kentucky Fields

An experimental gas-recycling operation in Allen County, Kentucky, in the Bowling Green area produces from the Silurian (Corniferous) limestone. The average thickness of the pay is 25 ft., average porosity 17 per cent, and a variable permeability ranging up to 2,100 md., but with an average of 150 md. This property has an average oil content of 490 bbl. per acre-ft., or a little over 11,000 bbl. per acre. There are 8 injection wells and 48 producing wells on a tract of 120 acres.

Although production figures are not now available, the degree of success already obtained by this project promises a wide application of repressuring methods in the limestone fields of southern Kentucky.

Tracer Gas Used to Check Repressuring Progress

The tracing of the path of gas put into formation through the injection wells on a repressure project has been one of the more pressing problems in this type of secondary recovery. A number of devices have been tried, but the simplest is the use of a small amount of tracer gas, mixed with the injection gas.

By HARRY F. SIMONS

SINCE the inauguration of repressuring as a means of increasing production or sustaining reservoir pressure, the path followed by the gas between the injection and the producing wells has been largely a matter of conjecture. In several cases it has been demonstrated that by washing the produced volumes of gas it is possible to control the movement of fluid in the reservoir (Volume-Control Repressuring Successful on Small Lease—by Herndon E. David, The Oil and Gas Journal, Oct. 16, 1941, p. 46).

However, much more information is needed than can be obtained through the regular gas-oil-ratio tests. In addition, there is an increasing number of projects in which more than one zone is being repressured. In such cases, it is extremely important to know the length of time required for the gas to pass from the injection well to the producing well; also in which formation the drive is proceeding most rapidly.

One solution of the problem has been developed by Carter Oil Co. for use on its Louden, Ill., repressure project. In this pool, three horizons are being produced over a great lateral distance. These horizons are the Cypress sand, the Paint Creek sand and the Bethel sand. All of the sands are reasonably similar, but there is a wide gradation of porosity and permeability in rather short distances. This is credited to the manner in which the oil-bearing horizons were originally laid down. Under such conditions, driving the oil may be expected to proceed faster in some parts of the field than in others and faster in one of the sands within the same area.

Spacing pattern followed at Louden has been the familiar Sunflower or Shuler plan. Producing wells were drilled on 10-acre spots on long 20-acre locations. This places a producing well in the NE and SW corners of the NW quarter; the NW and SW corners of the NE quarter; the NE and SW corners of the SW quarter and the SE and NW corners of the SW quarter of the quarter section. Input wells are drilled in the center of each quarter section and at the intersection of the half section and the section line. This puts eight producing wells in each quarter section which are affected by one centrally located input well and four input wells at the corners of the quarter section. (See diagram.)

It is evident from inspection of the plan that some of the producing wells may receive most of their gas from only one of the input wells. In other words, the drive of the oil may develop unevenly. Such a condition would not necessarily be indicated by the gas-oil-ratio test on the producing well. By occasional determination of the path followed by the gas, it is possible to tell when the movement of the oil in the reservoir is not taking place as planned.

The injection wells are equipped with packers so the input into each horizon can be controlled. The producing wells are not equipped with packers and produce through a common string of tubing. By injection of the tracer gas into one of the formations, the time for movement of the gas between the input and producing well can be determined.

When it is desired to test a well, approximately 600 cu. ft. of 70 per cent tracer gas is injected along with the repressure gas. This amounts to about 500 p.p.m. of the tracer in the injected gas. Gas from the producing well

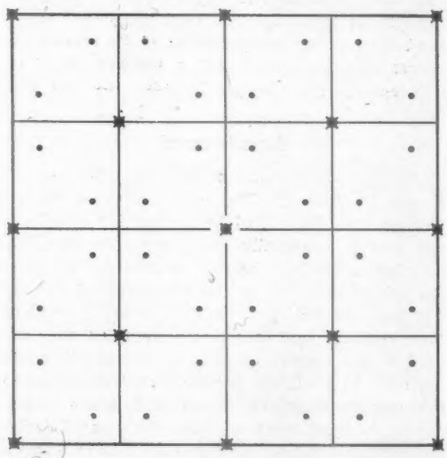


Diagram of spacing pattern used in the Louden, Illinois, field where three zones are being repressured. Use of a tracer gas allows a check to be made on the effectiveness of the gas drive

is then checked until evidences of the tracer begin to appear, build up, diminish and finally disappear. The shortest time taken for the tracer to show up in the producing well was only a few months in one case which showed there was evidently channeling of the formation. Injection in this particular case was discontinued temporarily.

The amount of tracer in the produced gas ranges from 3 p.p.m. to 175 p.p.m. Practically all of the injected tracer is recovered from the reservoir.

The tracer gas used on these tests is manufactured in a small building, located at one of the compressor plants at Louden. Generation of the tracer gas is from carbon dioxide and charcoal. The plant has a capacity of 600 cu. ft. of 70 per cent pure tracer gas with two reactors in series operation per day at atmosphere. It is bottled at 900-lb. pressure. The procedure is for the test crew to take three bottles of gas out in the morning and three in the evening. These are connected to a bypass at the injection wells and the bottles are then purged of the tracer gas. The cost of the tracer gas is approximately 6 cents per cubic foot.

DIAMOND
ROLLER
CHAINS

TYPICAL OIL-FIELD STRUCTURES

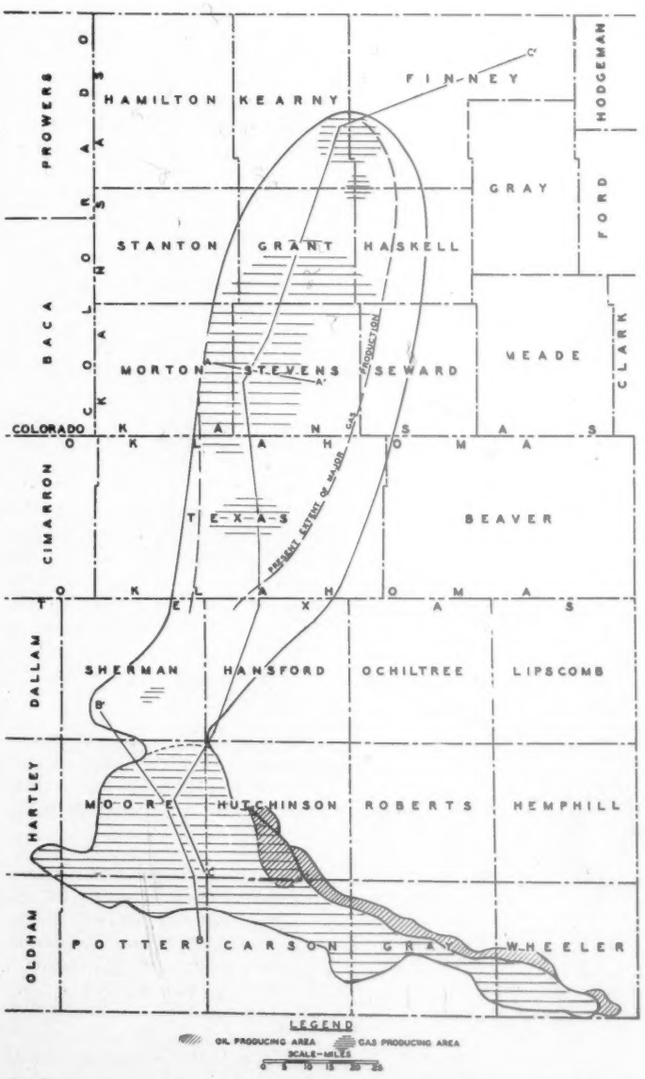
Regional High

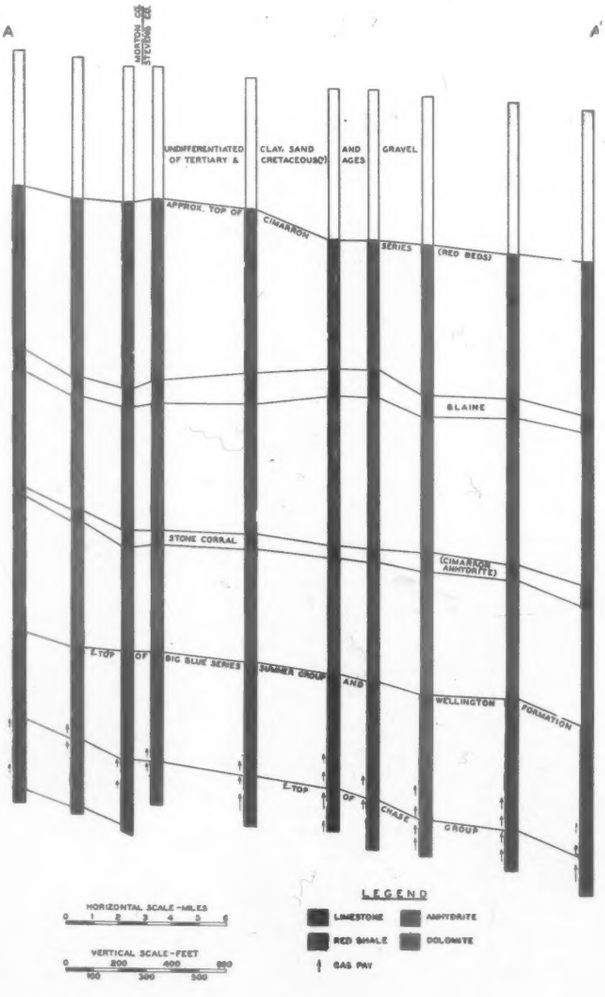
Panhandle and Hugoton Fields, Texas, Oklahoma and Kansas

(Compiled by The Oil and Gas Journal)

GENERAL GEOLOGY: The Panhandle-Hugoton area forms the largest gas-producing area yet found. The geological history revealed by the rocks penetrated by the drill at the present time begins with a surface terminated at the south end by a mountain range, the Amarillo Mountains, which form a continuation of the exposed Wichita-Arbuckle mountain system of Oklahoma. During later Pennsylvanian and Permian times this area was submerged with the formation of the Dodge City or Anadarko basin to the northeast of the mountains and the West Texas Permian basin to the south. Detrital material from the mountains was washed into the basin and limestones and dolomites were deposited. Subsequently, the basin became more saline and anhydrite, followed by salt, was also laid down. The upper Permian deposits are predominantly red beds with anhydrite and gypsum. Above the Permian red beds are undifferentiated continental deposits of Tertiary and Quaternary age.

STRUCTURE: With subsidence of the Amarillo Mountains, faulting took place and continued over a considerable period. Accumulations in the Panhandle sector are largely confined to the ridge and to the area to the north although the famous Amarillo gas field, which contains large quantities of helium, is on the Bush dome to the south. The Hugoton area is, so far as is now known, on a monocline in which the Permian rocks dip eastward and no pronounced





Left: Map of the Panhandle-Hugoton field showing the distribution of producing and probably producing areas. Right: Cross-section A-A' across the Hugoton gas field

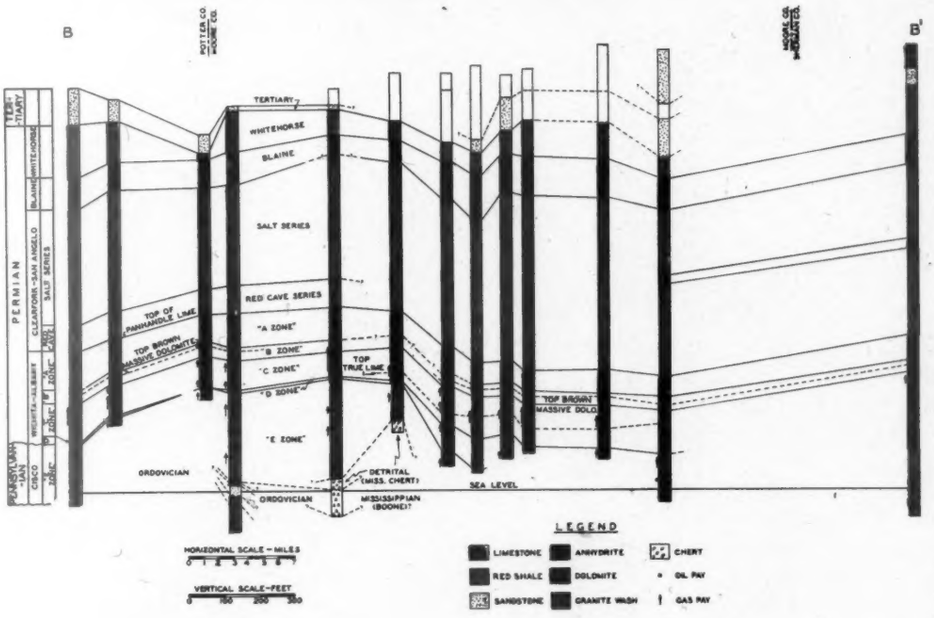
reversal is found east of the Las Animas arch in eastern Colorado.

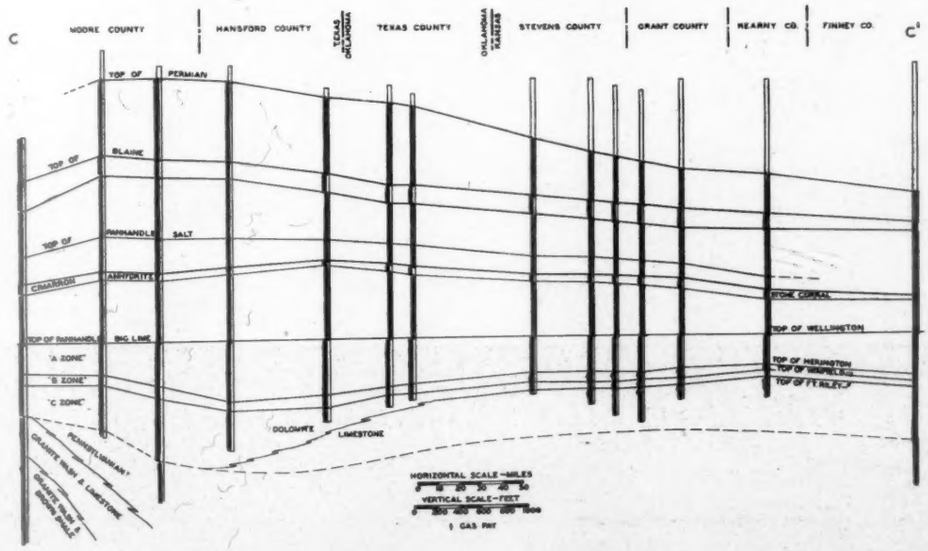
OIL-BEARING HORIZONS: The lowest producing horizon is the granite wash zone in the Panhandle district which grades into limestone away from the arch. Above this are four other dolomite or limestone zones. Rogatz places an unconformity between the third and fourth zones which he considers the top of the Cisco (Pennsylvanian). The three upper zones have been correlated with the Hugoton pays and there is evidence that they are leached zones in which the porosity was developed during relatively brief periods when the sea had withdrawn from the area. It is possible that the porosity of the Fort Riley is primary as the limestone is oolitic.

ORIGIN OF THE OIL AND GAS: Oil is found only along the northern margin of the Panhandle area with gas over the top of the high and throughout the Hugoton district. The water-oil contact is at approximately sea level, although not uniformly so. This was considered significant by some geologists when coupled with the abnormally low gas pressures, about 440 lb. The uniformity of the initial pressures throughout the area as well as in the different pay horizons suggests that the reservoirs were connected although secondary cementation may later have separated large sections from one another. It is possible that the source materials for oil and gas entered the various pays when the sea level was down the structure so that there was inadequate source material to fill the whole porous zone with oil and gas in volume sufficient to develop normal pressures on burial. If this view is correct, it is reasonable to expect that oil will be found between the developed gas area and the water level practically completely around the structure, although the belt may not be as wide as the zone under production at this time.

OTHER FIELDS OF THE SAME TYPE: No other accumulations of this magnitude are known, and few accumulations on the eroded tops of buried granite ridges have been developed. The group of fields along the Nemaha buried ridge of Kansas and Oklahoma are similar in that the granite core formed a positive area which later was reelevated to form structures in the younger beds. There are also many examples of multiple limestone pays associated with erosion surfaces on a broad scale. These include the Trenton gas field of Ohio and Indiana and the West Texas Permian limestones and dolomites. Except for the concentration of the pays within a limited stratigraphic section the Central Kansas uplift furnishes another example of accumulation on a broad regional scale. The Otis gas and oil field of Rush County and the Ray pool of Phillips County, together with accumulations in granite and granite wash in Russell County, Kansas, lead to the view that the buried granite of the Central Kansas uplift may also prove productive over a very large area.

EXPLORATION METHODS: Regional highs such as the Amarillo Mountains are discovered by combining the results of exploration, both surface and subsurface, in many areas. Granitic highs are also found by practically any of the well-known geophysical methods, including the magnetometer. The localization of gas and oil reservoirs on the flanks or crests of these highs calls for detailed subsurface or geophysical exploration for local belts of folding, noses or other evidences of favorable structural conditions. Structural conditions leading to the discovery of such fields as Hugoton are more difficult to locate. Speculative thinking and random drilling are probably the most successful pending some accurate method of discovering the presence of fluids in place underground.





Above left: Cross section B-B' across the west end of the Panhandle gas field. Below: Section C-C' from the center of the Panhandle gas field to Finney County, Kansas

Principal references: Henry Rogatz, Geology of Texas Panhandle Oil and Gas Field, A.A.P.G. Bull., Vol. 23, No. 7, pp. 983-1,053. Clenon C. Hemsell, Geology of Hugoton Gas Field of Southwestern Kans, idem. pp. 1,054-87. John L. Garlough and Garvin L. Taylor, Hugoton Gas Field, Grant, Haskell, Morton, Stevens, and Seward counties, Kansas, and Texas County, Oklahoma. Stratigraphic Type Oil Fields, p. 78.

S S C SPECIALIZES IN THE ACCURATE REVEALING OF GEOLOGIC STRUCTURE

Normal fault in sandy shale, Chilhowee Mountain, Tenn.

Photo courtesy United States Geological Survey

Methods of Preparing Butadiene

This series of articles presents a complete summary of the sources of butadiene as revealed by the technical literature and by the research staff of Universal Oil Products Co. It contains a total of 38 tables of data. A list of the subjects covered was published on Page 41 of the November 5 issue of the Journal.

By GUSTAV EGLOFF and GEORGE HULLA
Universal Oil Products Co., Chicago, Ill.

(PART 3)

Table 5 considers the thermal treatment of cyclohexenes to produce butadiene-1,3 among other products. The simplest member considered, cyclohexene, yields up to 49.4 per cent of butadiene-1,3 at a "bright red heat" in an "isoprene lamp." The mechanism of the conversion, which theoretically gives 65.9 per cent of butadiene-1,3 by weight, is one of decyclization and deethenation. A related reaction, that of the depolymerization of 1-vinylcyclohexene-3, produced 60 per cent of the theoretical quantity (100 per cent) of butadiene-1,3. Two interesting decyclization plus depropenations are considered, namely, those of 1-methylcyclohexene-1 and 1-methylcyclohexene-3 to principally form 2-methylbutadiene-1,3 and butadiene-1,3, respectively. Secondary decomposition of the 2-methylbutadiene-1,3 into butadiene-1,3 may account for the small yields of the latter from 1-methylcyclohexene-1

TABLE 5—THERMAL TREATMENT OF CYCLOHEXENES

Cyclohexenes		Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
Cyclohexene	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Not described	Red heat	1	B yield = ?	Badische Anilin und Soda Fabrik, German Patent 252,499 of Oct 23, 1912.
Cyclohexene	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Quartz or platinum tube. Cannot use Fe or Ni tubes.	Red heat	1	B yield = ?	Badische Anilin und Soda Fabrik, British Patent 27,387 of Nov. 21, 1912.
Cyclohexene	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Chromel C resistance ribbon	Bright red heat		B yield was 42.8-49.4% by weight on feed.	"Organic Syntheses," John Wiley & Sons, Inc., New York, 17, 25-29 (1937).
Cyclohexene	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Quartz tube for all conditions	600-625-650-700-750	0.0263-0.0526 in all cases	B yield at 650° was 12.9% by weight on feed. Also gave data for the other conditions.	N. D. Zelinskii, B. M. Mikhailov, and Yu. M. Arbuzov, J. Gen. Chem. (U.S.S.R.) 4, 856-865 (1934); Compt. rend. acad. sci. U.R.S.S. [N.S.] 5, 208-212 (in German, 212) (1934); Translation S-151 in Jan. 30, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Cyclohexene in the presence of nitrogen containing 1.4% of oxygen	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Quartz tube	650	0.1?	B yield was 34.6% by weight on absolute cyclohexene feed and 41.6% by weight on cyclohexene fully decomposed.	N. D. Zelinskii, B. M. Mikhailov and Yu. M. Arbuzov, J. Gen. Chem. (U.S.S.R.) 4, 856-865 (1934); Compt. rend. acad. sci. U.R.S.S. [N.S.] 5, 208-212 (in German, 212) (1934); Translation S-151 in Jan. 30, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Cyclohexene in the presence of steam	$C_6H_{10} \rightarrow C_4H_6 + C_2H_4$	Quartz tube for all conditions	650	0.1?	Maximum B yield in 3 tests was 33% by weight on absolute cyclohexene feed and 43% by weight on cyclohexene fully decomposed.	N. D. Zelinskii, B. M. Mikhailov, and Yu. M. Arbuzov, J. Gen. Chem. (U.S.S.R.) 4, 856-865 (1934); Compt. rend. acad. sci. U.R.S.S. [N.S.] 5, 208-212 (in German, 212) (1934); Translation S-151 in Jan. 30, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
1-Methylcyclohexene-1 in the presence of steam	$C_7H_{12} \rightarrow C_4H_6 + C_2H_6$ (principal reaction is $C_7H_{12} \rightarrow C_5H_8 + C_2H_4$)	Quartz tube for all conditions	650 690	0.079-0.132 0.079-0.132	B yield at 650° was 0.38% by weight on absolute methylcyclohexene feed and 0.73% by weight on methylcyclohexene fully decomposed. B yield at 690° was 0.25% by weight on absolute methylcyclohexene feed and 0.45% by weight on methylcyclohexene fully decomposed.	N. D. Zelinskii, B. M. Mikhailov, and Yu. M. Arbuzov, J. Gen. Chem. (U.S.S.R.) 4, 856-865 (1934); Compt. rend. acad. sci. U.R.S.S. [N.S.] 5, 208-212 (in German, 212) (1934); Translation S-151 in Jan. 30, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
1-Methylcyclohexene-3 in the presence of steam	$C_7H_{12} \rightarrow C_4H_6 + C_3H_6$	Quartz tube for all conditions	650-690 690	0.079-0.132 0.079-0.132	B yield at 690° was 21.5% by weight on absolute methylcyclohexene feed and 31.7% by weight on methylcyclohexene fully decomposed. Also gave data for 650°-690° conditions.	N. D. Zelinskii, B. M. Mikhailov, and Yu. M. Arbuzov, J. Gen. Chem. (U.S.S.R.) 4, 856-865 (1934); Compt. rend. acad. sci. U.R.S.S. [N.S.] 5, 208-212 (in German, 212) (1934); Translation S-151 in Jan. 30, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
1-Vinylcyclohexene-3	$C_8H_{12} \rightarrow 2\,C_4H_6$				See patents for details.	Russian Privilege (patent) 24181, Class 12; Russian Patent Certificate 49740 of Sept. 29, 1911; I. I. Ostromyslenskii, J. Russ Phys.-Chem. Soc. 47, 1,472-1,494 (1915); Translation S-152 in Feb. 6, 1942 Universal Oil Co. Products Survey of Foreign Petroleum Literature.

(Continued on next page)

TABLE 5—THERMAL TREATMENT OF CYCLOHEXENES (Continued)

Cyclohexenes		Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
1-Vinylcyclohexene-3	$C_8H_{12} \rightarrow 2\,C_4H_6$		500-600		B yield was 60% by weight o.. feed.	P. V. Zhavoronkov, Kauchuk i Rezina (Caoutchouc and Rubber) 1940, No. 11, pp. 10-14; Abstract S-117 in July 4, 1941 Universal Oil Products Co. Survey of Foreign Petroleum Literature.
1-Vinylcyclohexene-3 in the presence of benzene vapor	$C_8H_{12} \rightarrow 2\,C_4H_6$	Pt wire	High temperature	1	B yield = ?	I. I. Ostromyslenskii, British Patent 6,301 of June 13, 1913.
1-Vinylcyclohexene-3 in the presence of benzene vapor	$C_8H_{12} \rightarrow 2\,C_4H_6$	Pt wire	500-600	0.132		I. I. Ostromyslenskii, J. Russ. Phys.-Chem. Soc. 47, 1,947-1,978 (1915).

Table 6 gives data on the formation of butadiene-1,3 from benzene. The yield is stated to be "negligible." The yield may be a few per cent by weight on the benzene. The conversion of benzene into butadiene can be interpreted as a decyclization plus a prior or concurrent hydrogenation by hydrogen secured through formation of diphenyl. The present authors believe that the butadiene yield from benzene will increase toward the theoretical 13.85 per cent by weight with increase in knowledge of intermolecular hydrogenation and dehydrogenation.

TABLE 6—THERMAL TREATMENT OF BENZENE

Equation	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks	References
$5\,C_6H_6 \rightarrow C_4H_6 + 2\,C_6H_5 \cdot C_6H_5 + C_2H_4$	Isoprene lamp with Fe + Ni filament			Butadiene-1,3 yield was "negligible."	I. I. Ostromyslenskii, J. Russ. Phys.-Chem. Soc. 47, 1,472-1,494 (1915); Translation S-152 in Feb 6, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature; I. I. Ostromyslenskii, "Kauchuk i Ego Analogi," Moscow (1913), pp. 159 and 217.

Table 7 presents data on the thermal cracking of petroleum and its fractions, from 1873 to date, for which butadiene-1,3 formation is established through isolation of 1,2,3,4-tetrabromobutane or other unequivocal derivatives. The tabular data indicates that the maximum yields of butadiene which have been obtained from naphtha, gasoline, kerosene, gas oil, topped crude, and straight crude oil are 5, 15, 12, 3, 10, and 17 per cent by weight, respectively. Cracking in vacuo or in presence of diluents offers advantages over pressure treatment at somewhat lower temperatures.

Great interest centers on the naphtha cracking processes discussed in oil journals. They are an integral part of a "quickie" butadiene program created to supply raw materials for synthetic-rubber production prior to the operation of permanent, larger scale plants. Five of these processes are thermal in nature:

1. Thermal cracking in furnaces provided with "steel" or high alloy tubes is the simplest procedure, requiring temperatures of 732°-788° C. and furnishing a low yield of butadiene.

2. Cracking of heavy naphtha in the presence of steam utilizes a conventional regenerative system (e.g., four stoves filled with checkerbrick and alternately heated to 1,093°-1,204° C. by combustion products) or improvised shell stills containing heated firebrick, for generating superheated steam at 982° C. By preheating the naphtha in a coil to 593° C. and then contacting it with the superheated steam in a reactor operating at 760° C., it is possible to obtain a 4 per cent weight yield or more of butadiene. A direct-contact water spray or quench, a steam condenser, and butadiene recovery system are further requisites.

3. Thermal treatment with hot flue gas is similar in character and yield to cracking in the presence of steam. This requires preheating of naphtha and steam in separate coils to 593° C., preparation of high temperature flue gas, and the contacting of naphtha vapors, superheated steam, and high temperature flue gas in a suitably designed reactor functioning at 849° C. with 0.1 second contact time. The reaction products are immediately quenched to about 371° C., passed through a direct-contact condenser for removal of water vapor, and then into an absorption or distillation system, of which two types have been described, for butadiene recovery.

4. Cracking of naphtha in the presence of steam within regenerative furnaces produces 5 per cent of butadiene by weight on absolute hydrocarbon feed. A "carburetted water gas" set containing carborundum checkerbrick and fitted with a naphtha preheater falls into this category. The auxiliary equipment includes a condenser, compressor, and the usual butadiene separation system.

5. Cracking of naphtha by partial combustion thereof with injected air-producing temperatures of about 760° C.

TABLE 7—THERMAL CRACKING OF PETROLEUM AND ITS FRACTIONS

Charging stocks	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
Petroleum naphtha	Porcelain tube	Dull red heat		Recycling was suggested to augment B yield. The naphtha had 50°-80° C. boiling range	L. Prunier, Ann. chim. phys. (5) 17, 5-62 (1879); cf. L. Prunier, Compt. rend. 76, 1,410-1,413 (1893).
Petroleum naphtha	Pt wire network heated by electricity.	Dark red heat		B yield = ? The naphtha had 70°-100° C. boiling range and was of Caucasian origin.	Farbenfabriken vorm. Bayer and Co., German Patent 251,217 of May 13, 1912.
Petroleum naphtha	Furnaces containing carbon-steel tubes or, more favorably, high-alloy tubes.	732-788	1?	B yields were "low."	National Petroleum News 34, No. 31, 14-38 (1942).
Petroleum naphtha in the presence of steam	Regenerative furnace with carborundum checkerbricks (such as a carburetted blue gas set), condenser, compressor, and butadiene recovery system. Preheater for the feed.	760	1?	B yields were 5% by weight on absolute naphtha feed.	National Petroleum News 34, No 28, 20, No. 31, 14-38 (1942).

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TABLE 7—THERMAL CRACKING OF PETROLEUM AND ITS FRACTIONS (Continued)

Charging stocks	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
Petroleum naphtha in the presence of steam	The naphtha was preheated to 593° C. in a fire coil. Conventional regenerative system or improvised old shell stills filled with firebricks for generating superheated steam at 982° C. Suitably shaped reactor for the main reaction. Also used a direct-contact water spray, steam condenser, and a butadiene recovery system.	760	1.2	B yields were 4% by weight on absolute naphtha feed. The petroleum naphtha was of heavy gravity.	National Petroleum News 34, No. 31, 14-38 (1942).
Petroleum naphtha in the presence of steam and hot flue gas	Naphtha and steam were preheated to 593° C. in separate coils. A suitably shaped reactor received the preheated naphtha, superheated steam, and hot flue gas. Also used a quencher, direct-contact condenser, and a butadiene recovery system.	849	1?	B yields were 4% by weight on absolute, heavy gravity, naphtha feed.	National Petroleum News 34, No. 31, 14-38 (1942).
Gasoline fractions: Boiling range 77°-85° C.; Sp. Gr. 0.7036 at 15° C.; Alkanes + cyclohexane Boiling range 101°-103° C.; Sp.Gr. 0.7364 at 15° C.; Methylcyclohexane = ? Boiling point 117° C.; Sp. Gr. 0.7599 at 15° C.; 1,1-Dimethylcyclohexane = ? Boiling point 120.6° C.; Sp. Gr. 0.7707 at 15° C.; Dimethylcyclohexane = ?		750	0.0263-0.0395	B yields were 7.50% by weight on fully decomposed fraction of 77°-85° C. boiling range, 11.0% by weight on fully decomposed fraction of 101°-103° C. boiling range, 8.37% by weight on fully decomposed fraction of 117° C. boiling point, and 7.41% by weight on fully decomposed fraction of 120.6° C. boiling point.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet, Kauchuk 2, 11 (1932); "S. V. Lebedev, Life and Works," publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
"Baku" gasoline (boiling range 35°-129° C.; Sp. Gr. 0.7495 at 15° C.)		750	0.0263-0.0395	B yield was 11.08% by weight on fully decomposed gasoline.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet, Kauchuk 2, 11 (1932); "S. V. Lebedev, Life and Works," publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
"Galosha" gasoline (naphtha cut)	Technical retort	950	0.947	B yield was 14.4-14.6% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
"Galosha" gasoline (boiling range 95° to 115+° C.; Sp. Gr. 0.752, naphthenic)		550, 600, 650, 700, 750	1? in all cases	B yield at 600° C. was 8.3% by weight on feed. Also gave data for the 550°, 650°, 700°, and 750° C. conditions.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katzman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I., Leningrad (1935); Translation S-184 in May 22, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Technology.
"Krasnodar" aviation gasoline (boiling range 65° to 100+° C.; Sp. Gr. 0.7197; paraffinic)	Fe tube	650, 700, 750	1? in all cases	B yield at 700° C. was 4.5% by weight on feed. Also gave data for the 650° and 750° C. conditions.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katzman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I., Leningrad (1935); Translation S-184 in May 22, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Technology.

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TABLE 7—THERMAL CRACKING OF PETROLEUM AND ITS FRACTIONS (Continued)

Charging stocks	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
"Mid-Continent" gasoline	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, and stabilizer.	510	27.2	B yield was 5.8 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
Gasoline	Fe tube	780	1	B yield was 4.83% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Gasoline	Experimental station for cracking in the presence or absence of diluents.	700-800	Vacuo in absence of diluents	B yields were up to 10% by weight on "gasoline" feed, 12-15% by weight on second-grade gasoline feed, and up to 15% by weight on first-grade gasoline feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Kerosene fractions: Boiling range 110°-150° C.; Sp. Gr. 0.7742 Boiling range 150°-210° C.; Sp. Gr. 0.8042 Boiling range 210°-270° C.; Sp. Gr. 0.8413	Fe tube or else a porcelain tube (original article is indefinite).	700	1?	B yields were 3.5, 3.3, and 2.9% by weight on feed of boiling range 110°-150°, 150°-210°, and 210°-270° C., respectively.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katsman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I., Leningrad (1935); Translation S-184 in May 22, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Kerosene (boiling range 200° to 280+° C.; Sp. Gr. 0.825 at 20° C.)	Fe tube or else a porcelain tube (original article is indefinite).	600, 650, 700, 750	1? in all cases	B yield at 650° was 3.6% by weight on feed. Also gave data for the 600°, 700°, and 750° C. conditions.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katsman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I., Leningrad (1935); Translation S-184 in May 22, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Kerosene (boiling range 120°-300° C.; Sp. Gr. 0.8247 at 15° C.)		750	0.0263-0.0395	B yield was 5.22% by weight on fully decomposed feed.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet, Kauchuk 2, 11 (1932); "S. V. Lebedev, Life and Works," publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
"Mid-Continent" kerosene distillate	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, and stabilizer.	510	27.2	B yield — ? Stabilizer gas had 6.9% of B by volume.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
Kerosene	Method of B. V. Buisov				B. A. Kazanskii, A. F. Plate, and S. S. Artyunyan, Sintet, Kauchuk 2, No. 3, 13-18 (1933); Chem. Abs. 28, 3,567-3,568 (1934).
Kerosene	Isoprene lamp with Pt filament	White heat	Vacuo	B yield was 8-9% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Kerosene	Experimental station for cracking in the presence or absence of diluents.	700-800	Vacuo in absence of diluents	B yield was 11-12% by weight on feed kerosene.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Kerosene	Technical retort	900	0.947	B yield was 9.9% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Kerosene				Resulting cracked gas had 0.7% of B by volume.	V. I. Shvemberger, P. I. Dolin, S. S. Zolotarev, N. F. Okhapkina, and L. I. Nikolaev, Sintet, Kauchuk 4, No. 4, 13-23 (1935); Translation S-194 in July 3, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.

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TOUGH!

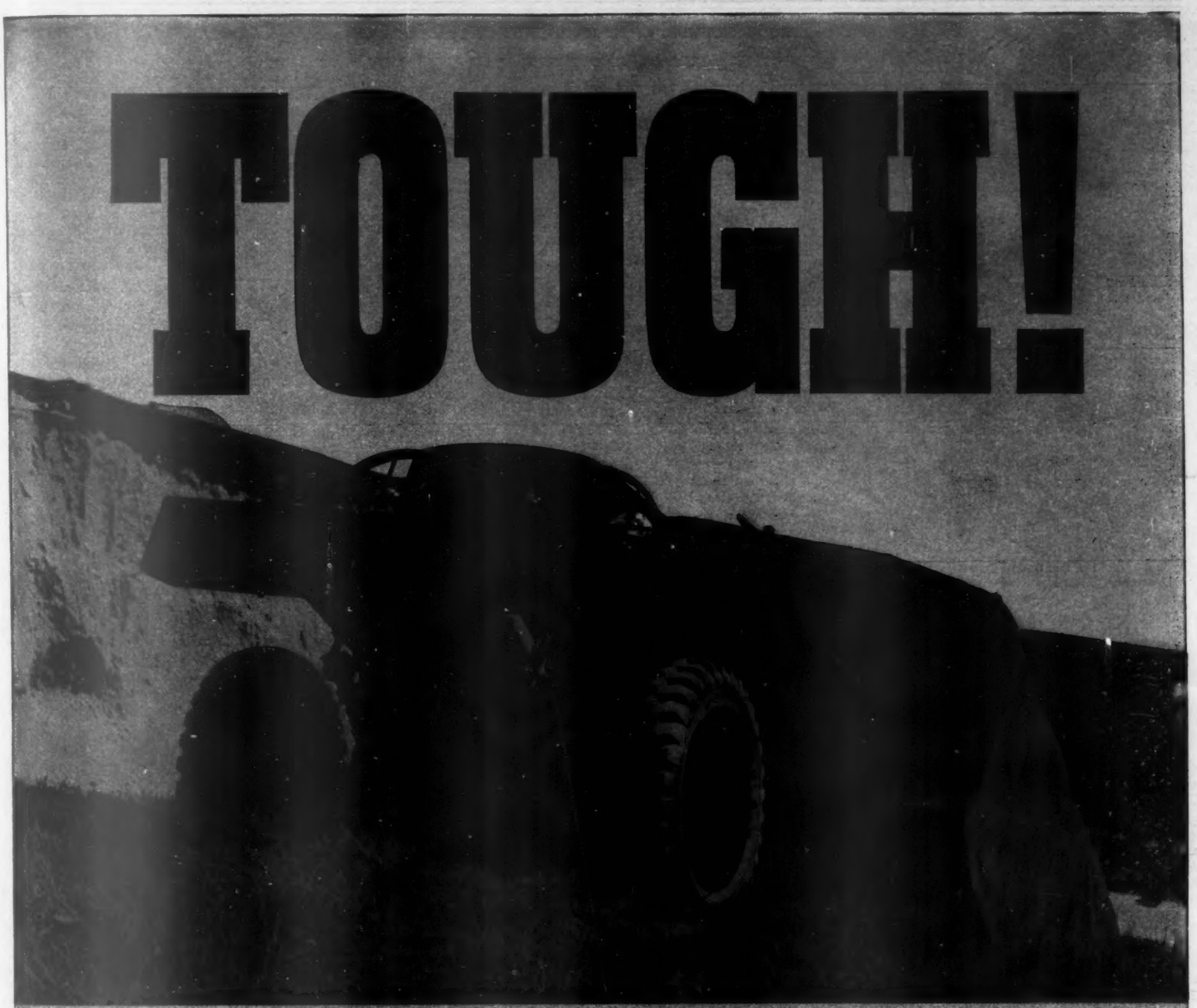

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TABLE 7—THERMAL CRACKING OF PETROLEUM AND ITS FRACTIONS (Continued)

Charging stocks	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
Solar oil (boiling range 275°-360° C.; Sp. Gr. 0.8862 at 15° C.)		750	0.0263-0.0395	B yield was 3.91% by weight on feed fully decomposed.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet, Kauchuk 2, 11 1932); "S. V. Lebedev, Life and Works," publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Machine oil	Experimental station for cracking in the presence or absence of diluents.	700-800	Vacuo in absence of diluents	B yields were 11% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Transformer oil	Experimental station for cracking in the presence or absence of diluents.	700-800	Vacuo in absence of diluents	B yields were 11% by weight on feed.	B. V. Buizov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
"California" heavy naphtha-light gas oil	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, and stabilizer.	500	27.2	B yield was 9.1 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
Cylinder oil (Sp. Gr. 0.92)	Fe tube or else a porcelain tube (original article is indefinite).	600, 650, 700, 750	1? in all cases	B yield at 650° C. was 2.5% by weight on feed. Also gave data for 600°, 700°, and 750° C. conditions.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katsman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I. Leningrad (1935); Translation S-184 in May 22, 1942 Universal Oil Products Co. Survey of Petroleum Literature.
Gas oil (boiling range 200° to 340+° C.; Sp. Gr. 0.865)	Fe tube or else a porcelain tube (original article is indefinite).	550, 600, 650, 700, 750	1? in all cases	B yield at 650° C. was 3.0% by weight on feed. Also gave data for 550°, 600°, 700°, and 750° C. conditions.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katsman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I. Leningrad (1935); Translation S-184 in May 22, 1942 Universal Oil Products Co. Survey of Petroleum Literature.
"California" gas oil	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, and stabilizer.	510	23.8	B yield was 20 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
"East Texas" gas oil	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, and stabilizer.	510	23.8	B yield was 21 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
Gas oil	Fractionation equipment for crude benzene	780		B yield was 6.5% by weight on the forerunnings from crude benzene.	L. Potolovskii and A. Vimberg. Azerbaidzhanskoe Neftyanoe Khoz. 1936, No. 2-3, pp. 90-100; Translation S-189 in June 19, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Fuel oil	Vapor-phase cracking unit. Fractionation equipment for cracked gases.			B yield was 18.0% by weight on the light gasoline fraction obtained by fractionation of cracked gases.	M. B. Markovich and V. V. Pigulevskii, Neftyanoe Khoz. 18, 425-444 (1930); Chem. Abs. 25, 1,979 (1931).
"Bibi-Eibat" Mazut (Sp. Gr. 0.9351 at 15° C.)		715	0.0263-0.0395	B yield was 2.55% by weight on feed fully decomposed.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet, Kauchuk 2, 11 (1932); "S. V. Lebedev, Life and Works," Publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.

(Continued on Next Page)

TABLE 7—THERMAL CRACKING OF PETROLEUM AND ITS FRACTIONS (Continued)

Charging stocks	Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B is butadiene-1,3)	References
Paraffin wax (melting point 53.2° C.)	Fe tube or else a porcelain tube (original article is indefinite).	650 700	1? 1?	B yields were 2.5 and 2.4% by weight on feed at 650° and 700° C., respectively.	A. F. Dobryanskii, E. K. Kanep, and S. V. Katsman, Transactions of the Research Plant "Khimgaz," Materials on Cracking and Chemical Treatment of Cracked Products 2, 60-97 (1935), publ. by O. N. T. I., Leningrad (1935); Translation S-184, May 22, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Topped crude oil	Experimental station for cracking in presence or absence of diluents.	700-800	Vacuo in absence of diluents	B yield approached 10% by weight on feed hydrocarbons.	B. V. Bulzov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
"Mid-Continent" topped crude oil	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, stabilizer.	510	17.0	B yield was 10 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
"Somerset" topped crude oil	Continuous cracking unit; tubular heating coil, reaction chamber, flash chamber, fractionator, condenser, receiver, stabilizer.	495	17.0	B yield was 13 cu. ft. per barrel of feed.	G. Egloff and J. C. Morrell, Ind. Eng. Chem. 26, 940-944 (1934).
"Bibi-Eibat" crude oil (boiling range 141°351° C.; Sp. Gr. 0.8952 at 15° C.)		750	0.0263-0.0395	B yield was 3.73% by weight on fully decomposed feed.	S. V. Lebedev, G. M. Kagan, S. V. Katzman, B. D. Kustrya, V. G. Moor, M. P. Ugryumova, and G. S. Shantarovich, Sintet Kauchuk 2, 11 (1932); "S. V. Lebedev, Life and Works," publ. by O. N. T. I. Khimteoret, Leningrad (1938), pp. 471-490; Translation S-182 in May 8, 1942, Universal Oil Products Co. Survey of Foreign Petroleum Literature.
Crude oil	Apparatus for 780° C. condition was not described. Experimental station for cracking in the presence or absence of diluents was used for 700°-800° C. conditions.	780 700-800	0.0921-0.118 Vacuo in absence of diluents	B yield was 16-17% by weight on feed hydrocarbons at 780° C. and 0.0921-0.118 atm. pressure. B yield was 10-11% by weight on feed hydrocarbons at 700°-800° C., using vacuo or diluents.	B. V. Bulzov, J. Applied Chem. (U.S.S.R.) 6, 1,074-1,092 (1933); Foreign Petroleum Tech. 2, 185-193, 213-242 (1934).
Petroleum	Apparatus for petroleum cracking, compression of the oil gas secured, and fractionation of the resulting light oil ("Railway Hydrocarbon").			B yield was 6.2 g. from 1 l. of the light oil, according to Birch.	E. Caventou, Ber. 6, 70 (1873); H. E. Armstrong, J. Soc. Chem. Ind. 3, 462-468 (1884); H. E. Armstrong and A. K. Miller, J. Chem. Soc. 49, 74-93 (1886); A. Colson, Bull. soc. chim. (2) 48, 52-57 (1887); G. Griner, Compt. rend. 116, 723-725 (1893); 117, 553-556 (1893); S. F. Birch, Ind. Eng. Chem. 20, 474 (1928).
Petroleum (?)	Oil gas process (?) used in Paris, 1876.			B content of Paris illuminating gas was 0.0031% by volume.	M. P. E. Berthelot, Compt. rend. 82, 927-932 (1876).
Petroleum	Oil gas process.			B content of oil gas was not stated.	E. Grimaux and C. Cloez, Bull. soc. chim. (2) 48, 31-35 (1887).
Petroleum	Oil gas process.	750-1000		B content of oil gas was not stated.	W. A. Noyes, W. M. Blinks, and A. V. H. Mory, J. Am. Chem. Soc. 16, 688-697 (1894).
Petroleum	Gyro process (i.e., vapor-phase cracking).			Cracking gas had 5.5% of "B + butenes."	C. R. Wagner, Refiner Natural Gasoline Mfr. 9, No. 6, 70-74, 162 (1930).
Petroleum	Vapor-phase cracking equipment.			B yield was 18-20% by weight on "butene concentrate" obtained with —8° to +2° C. boiling range.	V. V. Pigulevskii and S. A. Nazarov, Neftyanoe Khoz. 20, 292-300 (1931); Chem. Abs. 26, 4,450-4,451 (1931).
Petroleum	Vapor-phase cracking unit.	566-593	?	B yield was 15-20% on "butene concentrate" obtained.	B. T. Brooks (assignor to Petroleum Chemical Corp.), U. S. Patent 1,879,599 of Sept. 27, 1932.
Petroleum	Vapor-phase cracking unit.	538-649	?	B yield was 15-20% on "butene concentrate" obtained.	B. T. Brooks (assignor to Standard Alcohol Co.), U. S. Patent 1,988,479 of Jan. 22, 1935.
Petroleum	High - temperature cracking unit. Compression and fractionation equipment for compression gasoline.	"High"		B was present in a fraction (boiling range up to 20° C.) obtained by fractionation of the compression gasoline.	S. F. Birch and W. D. Scott, Ind. Eng. Chem. 24, 49-50 (1932).

Gas From Chapel Hill Used For Lifting East Texas Oil

Use of gas from the Chapel Hill field for supplying energy for gas-lift operations in the East Texas field involves treatment of the gas to avoid freezing. Utilization of the high-pressure gas permits greater production of condensate and its use in East Texas permits additional gasoline recovery before the residue is marketed. This article discusses the different installations used in the system.

CLOSELY related to the oil industry's war effort, which in principle is the maintenance of production with the minimum withdrawals of additional equipment from factory or stock, is the increasing availability of high-pressure gas in the East Texas field for gas lift of producing wells.

When an East Texas well ceases to flow naturally, and if high-pressure gas is available, all that is required to put it on artificial lift is a gas regulator, a small amount of line pipe, a few gas-lift valves to be installed in the tubing, and several common fittings.

Thus the gas-lift method of production meets the war need for steel conservation. However, restrictions at the present time on the purchase of gas-lift equipment are the same as those limiting the installation of pumping equipment. It seems reasonable to suppose that present orders will be modified so that further conservation of steel may be brought about by allowing wells to be placed on gas lift in preference to the installation of pumping equipment.

The main source of high-pressure gas for the East Texas field is from the Chapel Hill field about 12 miles to the west. This supply has recently been increased by a second 6-inch main line, with laterals that extend from the Chism Survey in the southernmost part of Gregg County north and northeast as far as the East Mountain area in the Hooper Survey of Upshur County.

These interfield gas systems have a number of advantages as well as several complications. They provide a market for the stripped gas resulting from condensate recovery in the Chapel Hill field, and such a market is necessary before condensate production can proceed under the conservation laws. A line to the East Texas field amply fulfills this conservation requirement, for after the gas has been used for artificial production, it normally goes to the gasoline plants for further vapor recovery. After being processed by the plants, the dry gas is available for the marketing systems of the area for whatever purposes it may be required.

Gas-Lift Heat Exchangers

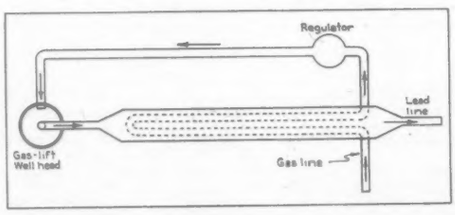
The only troublesome problem encountered in the use of gas lift with high-pressure gas in the East Texas wells had been quite thoroughly overcome by the end of the last winter. This problem was the freezing up of regulators due to the expansion of the induction gas when the pressure was reduced in one stage from approximately 800 lb. down to about 300 lb. Freezing of water and gas hydrates in the regulators has been overcome by heating the gas locally immediately ahead of the regulator at each well.

A simple heat exchanger which entirely avoids fire hazard has been placed in operation at a number of gas-lift wells. Just before the high-pressure gas reaches the regulator it passes through a coil where it is warmed by the fluid emerging from the well. The heat exchanger is made by installing a 40-ft. joint of 8-in. pipe as an enlarged section in the 4-in. lead line from the well. A coil is made up with two joints of 2-in. pipe and a U-bend, and this double 2-in. section is inserted into the enlarged section so that the well fluid will flow around it while the gas is passing through it. After passing through this 60 to 80 ft. of 2-in. pipe, the gas temperature has been raised sufficiently so that it can actuate the regulator without freezing up.

At some wells there is a source of heat that can be utilized more easily for preventing regulator freezeups. If the production is being heated as part of the treating program, hot fluid from the gun barrel is usually used to preheat the high-pressure gas ahead of the regulator.

Condensate Recovery

Gas and condensate in the Chapel Hill field is obtained from the Paluxy sand, found between 5,700 and 5,800 ft.; from the Rodessa section of the Glen Rose at approximately 7,350 ft.; and from the Pettit zone at about 8,100 ft. All of these zones produce gas yielding about 60 bbl. condensate per million cubic feet when the pressure is reduced to 650-800 lb. Optimum recovery is obtained at a temperature closely approaching the freezing temperature of the gas hydrates, so a close balance must be kept on regulators and temperature-control devices to obtain the maximum recovery while at the same time preventing freezeups at regulators, valves, or in flow lines.



Type of heat exchanger used on some wells in the East Texas field for preventing regulator freeze ups

One typical installation is herewith described: First, a positive choke is used at the well head to hold the production to the approximate maximum amount of gas required. The temperature from the well fluctuates with the rate of withdrawal, and it is necessary to reduce this temperature in order to get the desired constant temperature at the separator. This is accomplished by expanding the 2-in. flow line into a multiple line consisting of fourteen 40-ft. lengths laid parallel between headers in a water bath. A plentiful supply of water flowing through this bath lowers the gas temperature sufficiently. If the water supply were not available, it would be necessary to erect a cooling tower similar to those used on some of the other wells in the field.

The cooled gas, which has been reduced approximately 40° by the water bath while still under the flowing-well pressure of 2,000 lb., next passes through a combination gas heater and water cooler which thermostatically maintains the gas temperature within a range close to 100° F. Next, it passes through a regulator where the pressure is reduced to 675 lb. With this pressure drop there is a resultant drop in temperature to 66°-68° F., which is just above the dew point of the gas at this pressure. An additional temperature drop of 2° or 3° will thus result in freezing of gas hydrates.

The gas, having been controlled as to pressure and temperature for maximum condensate recovery, then enters the high-pressure separator. The condensate recovery is dumped by automatic float control to the low-pressure separator, operating at 40 to 60 lb. pressure, and thence to the stock tanks where it is held under pressure until it can be run to the pipe line.

The temperature of the condensate in the low-pressure separator is very close to 32° F. Connate water carried by the gas caused frequent freezing up of the separator dump valve and flow line during early operation. This difficulty has been overcome by the following method: A hot-water heater was set at a safe distance from the tank battery and separators. A 1¼-in. line was then laid on either side and in contact with the flow line which conducts the condensate from the low-pressure separator to the stock tanks. The two 1¼-in. lines were joined so that hot water could be circulated down one to return to the heater by way of the other. All three lines were then wrapped together with insulating materials. An outlet from this circulation system provides for discharging warm water over the dump valve of the low-pressure separator. When needed, the water heater will provide steam for greater heating efficiency.

Dehydrators

In order to make possible the uninterrupted delivery of high-pressure Chapel Hill gas to the East Texas field it is necessary to reduce the hydrate content of the gas. Hydrates have come to the attention of transporters of high-pressure gas during the past few years mainly on account of the difficulties arising from their causing freezeups at temperatures possibly 30° above the freezing temperature of water.

Dehydration of gas is accomplished on one lease by the florite absorption process. The gas, which has been separated from the condensate in the high-pressure separator, passes through the lease meter and goes into a second high-pressure separator which serves as an additional scrubber.

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The two drying towers are 22 ft. high and 24 in. in diameter, and they are placed in operation alternately.

The drying towers are charged with florite, a granular form of fuller's earth having high absorbent properties. One hundred pounds of florite will absorb 7 lb. of water. As each tower has a capacity of 2,000 lb. of florite it will extract 140 lb. of water before the charge becomes fully saturated. It has been estimated that 4 million feet of gas will pass through one of these towers before the saturation point of the fluorite is reached.

A dew-point tester is used to determine the temperature at which the hydrates will be converted to ice under the existing gas-line pressure As the florite desiccant absorbs more and more water it becomes less effective, and the dew-point temperature of the gas emerging from the desiccant rises constantly until it becomes necessary to switch drying towers. In this manner a check is kept of results being obtained in the drying towers and the proper time for alternating the towers is thereby determined.

When the florite desiccant becomes saturated with water it is reactivated by passing hot gas through the tower. The gas is taken from the low-pressure separator of the condensate-recovery plant, and is heated to about 400° in a heater built on the grounds of used materials. In making the heating coil, pipes were driven into the ground and around these upright members about 150 ft. of 1¼-in. pipe was wrapped in the form of a spiral coil. Heating with torches made it possible to bend the pipe to the desired form. Over this coil the end of an old still was placed, and a chimney was mounted over a hole in the top. The coil is radiantly heated by gas firing that takes place in a duck's nest below ground level in the center of the coil. The hot gas is conducted to the towers by an underground plastic-asbestos insulated line.

This heated gas is introduced at the bottom of the tower which is to be regenerated, flows upward through the saturated florite and passes out the top carrying with it absorbed water. Commencing at the base, the tower gradually heats up. When the temperature is fairly even from bottom to top, the drying process is considered complete. Average time for drying one tower is about 6 hours. The tower is then allowed to cool down slowly before it is switched back into service.

The two lines now carrying high-pressure gas to the East Texas field are believed to have sufficient capacity to handle the entire gas-lift demand for some months to come, and it is doubted that the building of additional lines would be permitted. Eighteen days of complete shutdown in one month have proved very discouraging to East Texas operators, and as a result there is little demand for supplies, including high-pressure gas for artificial-lift purposes. However, any increase in demand for East Texas oil will probably be accompanied by an immediate increase in the number of gas-lift installations.

Guide Line Saves Labor in Removing Boiler Stacks

An arrangement by which a winch line used in removing or replacing a boiler stack can be fastened at the top of the stack without the necessity of a man climbing a ladder to reach the fastener has been devised by a Gulf Coast drilling contractor. Two eyes, one at the top and the other at the bottom, are welded to the stack with a small wire line stretched between them. To fasten the winch line, the end is looped around the wire at the bottom. When tension is applied to the winch line, the loop slides up the wire, which serves as a guide, to the top eye where it is held to lift the stack.

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Long-Stroke Pumping Unit Uses Mine-Hoist Principle

By NEIL WILLIAMS

MANY attempts have been made over a period of years to develop a satisfactory long-stroke, slow-motion pumping unit. With production being obtained at greater depths, and with growing importance being attached to salvaging oil in stripper wells requiring the lifting of large volumes of fluid without interruption, there are increasing occasions for the use of such a unit. So far, the problem of devising a means for applying suitable power, and of eliminating the unbalanced condition that normally exists at the end of each pumping stroke have stood in the way of its development.

Perfection of a pumping unit of this type is claimed by J. G. Gillespie, a power engineer in the East Texas field for many years and now located at Paris, Tex. In the design of the unit, which so far is limited to working models, application is made of an old mine-hoisting principle, that of variable leverage as supplied by conoidal drums, to eliminate the unbalanced condition that exists at the end of the pumping stroke. Although the idea and use of conoidal drums for hoisting is far from new, this is the first time, it is claimed, that any attempt has been made to apply the principle for lifting fluid from beneath the earth's surface.

Variable Leverage Obtained

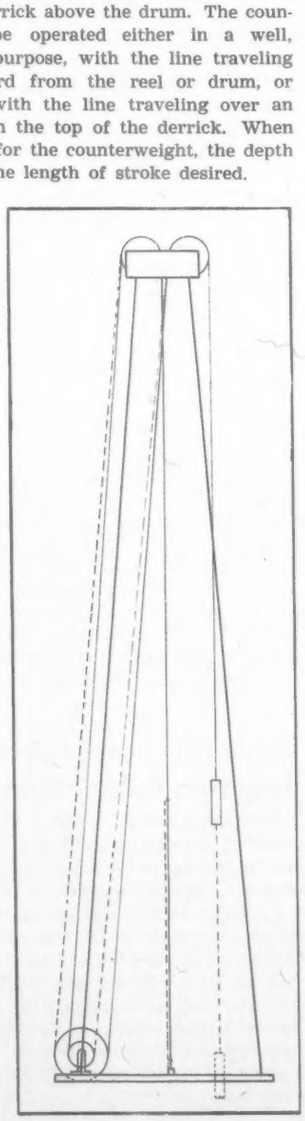
Variable leverage of a conoidal drum is obtained through the changes in its effective radii. It is this that gives the constantly changing counterweight effect in the operation of the new pumping unit, and provides the unbalancing action at the completion of each stroke to start or help start the succeeding stroke while the prime mover is in process of acceleration. The change in radius which controls the length of stroke and speed can be governed by the size of the cable reels and the thickness of the cable winding thereon, and by the steepness of the conical grooved drum. Elimination of the unbalanced condition at the end of a stroke makes practical the use of a simple prime mover in continuous frequent-reversing service.

Essentially, the new unit developed by Mr. Gillespie includes an automatic reversing controller for a prime mover; a speed-reducing mechanism operated by a drive connection from the prime mover; an operating shaft from the speed reducer; the conical drum, secured on the shaft, and on which is wound the cable or chain operating the pump rod, and the drum, on which is wound the line operating the counterweight. The arrangement of these elements is shown in accompanying drawings.

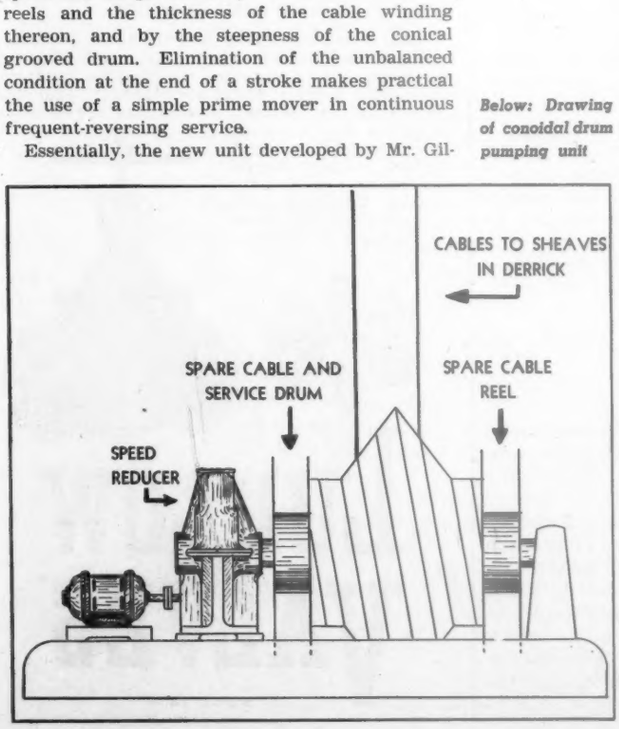
Design of Drums Can Vary

The principle of the conoidal drums can be applied to the pumping unit in two forms. In one design, the drum for the counterweight line is a separate, straight reel, while in the other it is an oppositely coned, grooved drum which is a unit of the conoidal drum for the line operating the pump rods. In the latter case, the two cables wind on and off in opposite directions with respect to each other from the opposite-facing cones. The line to the pump rods travels through blocks located in the derrick above the drum. The counterweight can be operated either in a well, drilled for this purpose, with the line traveling directly downward from the reel or drum, or in the derrick, with the line traveling over an auxiliary block in the top of the derrick. When a well is drilled for the counterweight, the depth is governed by the length of stroke desired.

Right: Derrick arrangement for conoidal drum pumping unit.



Below: Drawing of conoidal drum pumping unit



Operation of the unit is such that when the pump is at the end of its downstroke its cable is working through a short radius on its grooved, conical drum, while the counterweight line is working through a long radius on its drum, which is either the straight reel, a separate conical drum, or an oppositely coned, grooved drum. The upward stroke of the pump then is started by the counterweight, working on a larger drum radius than the pump line, without effort by the prime mover. The prime mover is put in operation by the controller after the upstroke is started, and finishes the stroke in normal operation. When the pump reaches the end of its upstroke, the controller deenergizes the prime mover. At this point the pump cable is working through a long radius while the counterweight line is working through a short radius, enabling the weight of the pump rods to start the downstroke without effort from the prime mover. After the downstroke is started the prime mover again is put in operation by the controller, finishing the downstroke, when the controller again deenergizes the prime mover, completing the cycle.

Pumping strokes of from 50 to 75 ft. are considered feasible with the unit, the length of the stroke being limited only by the size of the drum and the height in the derrick of the blocks through which the pumping and counterweight lines travel. With such strokes of this length there not only is a substantial reduction in loss of energy due to rod stretch as contrasted with the loss incurred in the usual stroke lengths of from 2 to 6 ft., but also the less frequent stretching involved in the long strokes results in much reduced rod fatigue. At the same time better operation of the working barrel can be obtained with the long stroke due to the more uniform speed over a greater distance, and a longer and heavier plunger can be used with less loss of working-barrel capacity. In the case of deep pumping, the long strokes obtain enough plunger travel to take up the rod stretch which might not be the case with the shorter length of stroke in which the stretch in a long string of rods might be nearly as great as the length of the stroke.

Unit Pulls Tubing and Rods

Tubing and rods can be pulled by the unit without delay or change in it except the removal of the counterweight. Longer tubing lift might result from the fact that the distribution of wear is distributed over a greater length of the tubing. It is considered a possibility that tubing be eliminated. Also, it is a possibility that a well be pumped with a cable instead of rods.

To obtain long cable life a few hundred feet of spare cable can be carried on each end of the drum, permitting the cable to be slipped when needed to place a new turn on the first active groove of the drum.

Other advantages claimed for the long-stroke unit are:

1. Elimination of gas lock by winding the plunger out of the barrel to release the gas.

2. Elimination of paraffin from center of tubing by rod joints which will pass all points in the tubing.

3. Loosening of sanded plungers by a jar in the rod line actuated by reversing the prime mover to produce the jarring action.

4. Reduction in cut oil and less disturbance of sand through the elimination of short choppy strokes.

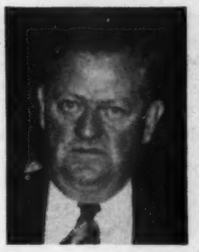
5. The unit can be equipped to shut down automatically when a well pumps off or starts to flow.

6. Slow rate of acceleration of the stroke reduces peak well weight.

Wartime Plant Design

By MAX B. MILLER
Chief, Equipment Procurement Section, Refining Division
Office of Petroleum Coordinator

A. P. I.



These extensive excerpts from Mr. Miller's paper presented before the Refining Division at the annual A.P.I. meeting give a general outline of how refiners are meeting the shortage of critical materials.

The author tells how operators have simplified design and construction in order to meet emergency conditions. He relates that OPC is working on a program of scheduling each war-plant project for a definite completion date.

OPC is asking for specific allocation of materials to meet completion schedules in order to avoid delays caused by tardy deliveries of equipment.

THE manner in which the industry has utilized substitutes, has developed shortcuts, and has refrained from using excessive factors in their plant design, all for the purpose of saving critical material, has been appreciated not only by the War Production Board but also by our office. Most of the activity in this particular connection has been initiated by the industry itself.

Many of the refiners and the engineering companies have drawn detailed specifications on the subject of wartime-plant design, which have been issued in the form of a directive to their own engineers. These specifications have been made available to the industry as a whole. In many instances, they have gone to the extreme in their effort to save critical materials.

The activities of the industry in curtailing the use of critical materials have not been confined merely to the use of substitutes. Many bottlenecks have been avoided and many shortcuts have been developed by changes in plant design. These have been responsible for cutting down the number of valves, instruments, and heat exchangers, even though each item thus removed would have been considered necessary in normal times. The design of many vessels and towers has been changed so as to utilize a type of head that might possibly have been found in stock or was otherwise readily procurable. Over-all excessive factors usually established as a means of fulfilling guarantees have been curtailed.

The industry has manifested its spirit of cooperation in still another way. Reference is made to the redistribution of surplus materials and equipment. At the request of our office, practically everyone engaged in the petroleum refining industry has offered lists of used or surplus material to be redistributed among those engaged in erecting war plants. Though this particular activity has been in effect for only a comparatively short time, we now have a record of the transfer of such materials amounting to approximately 1 million dollars.

Many Materials Scarce

There are still a number of items which are particularly difficult to secure. Reference is made to instruments, heat exchangers, valves and forgings. Their scarcity is not only due to a lack of an even flow of critical materials but also involves manufacturing facilities which are called upon to produce enormous quantities over a relatively short period. Though, as stated above, the industry has done much to curtail the use of these items, it would seem the better part of wisdom for each erector to make further efforts along this line. In this connection, you may be interested in the activities of one of the major companies who recently instituted a program for curtailing the installation of instruments. Their processing department made a complete survey of their instrument requirements in all plants being erected for the production of aviation gasoline. The instrument requirements were classified into three groups as follows:

1. Instruments considered absolutely essential for the operation of the plant.

2. Instruments that could be temporarily dispensed with by increasing the operating personnel.

3. Instruments that are necessary eventually for maximum efficiency, cost determinations, etc., but which could be dispensed with for a reasonable period without serious detriment.

As a result of this study, it was found that approximately 50 per cent of their instrument requirements fell within Class 1, 15 per cent in Class 2, and 35 per cent in Class 3. In other words, it was apparent that their normal instrument requirements could be cut in half if their purchases were based upon sheer necessity. It is not the intention of the company to do away with their normal instrument requirements permanently. They are making provisions for the installation of the less essential instruments at a later date. If each war plant could be so handled over the next few months, not only would the completion of all projects be hastened but the procedure should undoubtedly be beneficial to the instrument manufacturer since his manufacturing activities would be extended over a longer period.

It is felt that a somewhat similar result could be secured in the case of valves. It would be difficult to say that the same thing could be accomplished in the case of heat exchangers. On the other hand, the statement has frequently been made that it would be impossible to justify many heat exchangers which are installed in modern plants if they were given the same economic consideration that controlled the project as a whole.

Forgings Situation Acute

In the matter of forgings, the situation continues to be acute. It is not thought that substitutes should be utilized except where absolutely necessary for the reason that substitutes as a usual thing require extra manpower. It is felt, however, in those cases where forgings cannot be secured in time for plant completion, substitutes should continue to be used.

The preceding comments treat largely of the activities of the industry and little has been said as to the future plans of the OPC. This is perhaps as it should be. No matter how effective the OPC may be in assisting this program, the real work has to be done by the industry itself. Nevertheless, the future plans of our office in this connection should be of some interest. For some time past we have endeavored to secure the approval of a plan by which each project could be scheduled for a definite completion date on the basis of freezing the materials necessary and distributing them by allocation. At first it was the thought that the rubber program, the aviation-gasoline program, and the program controlling the erection of chemical plants needed in this connection could be correlated and the distribution of the materials handled as indicated. However, considerable opposition to the plan has developed because it is the intention of the WPB to eventually put the distribution of all materials for all purposes under allocation, and it was felt that the programs referred to above should not be so handled until the plan could be extended to embrace total requirements. The final decision as to the treatment of the above programs has not yet been made and though complete allocation will eventually come, it is apparent that the plan will not be available in sufficient time to take care of immediate requirements. In the meantime, however, we have been given considerable assistance by the War Production Board through their Determination 149. It reads as follows:

"All items in or for the continental limits of the United States of America originally rated AA-2 and now AA-1, pursuant to paragraph (e) under AA-2, of the military priorities directive dated June 12, 1942, in their entirety, are to be rated down to AA-3.

"Tools and equipment necessary in connection with the aluminum expansion program are to be rated up to AA-1 at once.

"The aluminum, alloy steel and high-octane gasoline-expansion projects are to be rated AA-2-x.

"AA-1 and AAA may be given to whatever items in the aluminum, alloy steel and high-octane gasoline-expansion projects as may be necessary; also where necessary in your opinion schedules may be frozen to meet the objectives of these programs."

Rating of 100-Octane Plants

There are two points of particular interest in connection with this determination. First, not only has the rating of the 100-octane gasoline plants been raised but the rating of many plants being erected for military purposes within continental United States has been lowered. Second, and still more interesting, is the provision made in the last paragraph of the determination. This provides for additional assistance on such items as cannot be secured with a rating of AA-2-x. The additional assistance can be secured either through the issue of a triple-A rating or a frozen order where such assistance is necessary. Broadly speaking, the present setup then permits us to utilize priority jut so long as priority is effective. When it is no longer effective through the additional assistance provided for, we will be substantially allocating in cases of necessity.

As a result of this determination we are requesting the principals for whom each project is being erected to submit to our office a complete list of such items as cannot be secured under a rating of AA-2-x. In making a request for a rating higher than AA-2-x, it is necessary that the following information be given in complete detail: the name of the company holding the priority, the location of the plant, the end product which the plant will manufacture, and the builder's serial number which was assigned to the project when the priority was originally

granted. The materials which cannot be secured with the AA-2-x rating should be tabulated in vertical columns under the following headings: Name of vendor, purchaser, purchase-order number, order date, description of material, quantity, dollar value, promised shipping date, and required shipping date.

It should be borne in mind that the triple-A rating will be granted only in case of dire necessity. Each item will be scrutinized by the War Production Board and by our office. The applicant should, therefore, use extreme care in determining the items requiring a higher rating so as to make sure that the higher rating is indispensable. It is felt that the WPB has gone a long way toward assisting our program by instituting the above procedure. Theirs is not only the job of getting our program completed but is one of fulfilling all requirements needed to win the war. We do not wish to destroy their confidence in our office or in the industry by applying for a higher rating than is absolutely necessary. Furthermore, if the procedure is abused, it will cease to function. We again ask, therefore, for the careful and prompt cooperation of the industry in this particular connection.

As intimated above, the WPB is at the present moment working on a plan by which the delivery of all materials needed for all things shall be scheduled and distributed according to their importance to the prosecution of the war. This plan is known as the Controlled Materials Plan. It will take time to make it effective. It will require a tremendous amount of effort on the part of industry as a whole and by the various governmental agencies. However, in the opinion of this office the plan has great promise. If properly executed, it should do many things. First, it will provide our office with a bank account of equipment and materials which will be frozen for our purpose and which we will be permitted to distribute according to a predetermined schedule. Second, it will permit those in authority to make decisions which may be depended upon since the material allotted will be based upon a definite requirement of end product which has been predetermined and authorized. Third, it should permit the refiners, the engineering companies, the manufacturers, and the erectors, to lay their plans according to the availability of the materials needed with a reasonable degree of certainty that assigned completion dates can be met.

As stated above, it will take some little time to bring this plan into practice. It will require a tremendous amount of effort on the part of industry and the various agencies in Washington. However, it would appear to be the consensus among those who are engaged in erecting war plants in petroleum refineries that the plan represents the only solution to our problem. We feel sure, therefore, that the industry will gladly take on this additional burden, and for the OPC I am glad to promise that we shall do our best to make the plan function.

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Discussions of A.P.I. Papers Stress Conservation of Steel

By HARRY F. SIMONS

This report on discussions following presentation of several technical papers at various sessions of the American Petroleum Institute's annual meeting in Chicago November 9-12 reflects the broad interest manifested in proposals to maintain operations with a minimum use of critical materials.

A dominating overtone, however, was caution against acceptance of alternate materials and practices to a point endangering the safety of operations. Much interest centered around completion of wells without casing where structural conditions are favorable.

THE continued operation of the drilling and producing branches of the industry was obviously the main concern of those attending the group sessions at last week's annual meeting of the A.P.I. After being informed by government representatives that the oil industry might be allotted enough steel to drill slightly over 15,000 wells next year, the methods and means of drilling and equipping other wells came to the front.

Production and material directors of OPC, Don R. Knowlton and Greer W. Orton, respectively, urged repeatedly that production men consider every possible means of conserving vital war materials—particularly steel. Both men stressed not only the consideration of noncritical materials but alternate methods as well.

One method for conserving large quantities of steel was discussed from the floor at considerable length by Wirt Franklin, OPC director for District 2, Chicago, and Robert V. New, Los Angeles, Calif. Mr. Franklin pointed out that in New Mexico (Loco Hills field) wells had been completed without the conventional oil string. A short protective string was needed to prevent contamination of upper water-bearing sands. The wells were equipped and produced through tubing. The matter was brought to the attention of the O'Mahoney committee when it visited New Mexico and was well received. No trouble has been experienced with these wells. In Ohio, according to Mr. Franklin, a number of gas wells have been completed without casing. The saving of approximately 3,000 ft. of casing per well is a major item in view of the present steel shortage.

Mr. New added that the necessity for increasing the low-gravity crude output of the shallow California fields had forced consideration of unusual completion practices. The needed 2,500 wells approximately 3,000 ft. deep will require around 7,500,000 ft. of casing. Considerable planning has been done on a system which includes a short surface string, a liner, tubing and a packer. The plan is to pull the tubing from present wells, equip them with casing pumps, and then use the tubing in new wells. If such a plan works, development of the shallow heavy-oil fields can continue with very little additional material.

Mr. Knowlton commented that in following such a program the subsurface conditions should be considered and as little risk as possible taken.

Informal discussions in the lobby following the last production group meeting brought out that numerous companies had been considering this and other methods of completing wells. Wood fiber pipe (already used in one well in Illinois) and asbestos fiber pipe have been suggested for shallow wells and some experimentation is under way. Where formations are competent conditions may be favorable for such practice. Most of these measures are looked on as temporary expedients and when completing wells in such a manner provisions will be made for later reequipping along conventional lines.

Another important point brought out was the necessity of getting permission of state regulatory authorities for such practices. In California, for instance, as brought by Mr. New, it may be necessary to obtain either an executive order or a legislative act. This will be necessary in all states which have regulations specifying the manner in which wells are completed.

Mud Problems Considered

Prepared discussions following the delivery of a paper on mud (A Review of Recent Advances in Drilling Mud Control, by Preston E. Cheney) brought out several recent developments.

The main difference among field men at the present is in terminology, according to E. W. Louden, Pure Oil Co., Houston, Tex. Different procedures now used are aimed at achieving the same results. Greatest problems at present are those connected with salt-water contamination and heaving shale. Treatments found to have value, in addition to those already commonly in use, include caustic soda, quebracho and phosphate, dicyandiamide in conjunction with the above and the silicate muds. Use of quick-setting gypsum cement for sealing porous formations when other plugging agents failed was also discussed.

K. L. VanderAhe, Richfield Oil Corp., Los Angeles, added that close cooperation between the research and field engineers was necessary. Also, automatic devices for recording density, viscosity and pH were an invaluable aid to the field engineer. Considerable success has been obtained on the West Coast with sodium bicarbonate for the reduction of viscosity due to a high pH caused by contamination by cement or soluble calcium salts.

Use of germicides is necessary for controlling fermentation and the growth of minute organisms in organic-colloid drilling mud, according to George R. Gray, Humble Oil & Refining Co., Houston. He added that a concentration of salt in the mud amounting to 10 per cent by weight will prevent fermentation. Maintaining a high pH in the organic-colloid mud made from fresh water has also been found useful in preserving it. This is different from the control of inorganic drilling fluids. The pH can be raised by adding caustic soda in amounts of 0.15 to 0.2 per cent by weight while at the same time adding quebracho. The organic colloidal material is then added and after the mud is put in use it can be controlled by further additions of caustic.

A. J. Teplitz, Gulf Research & Development Co., added that it is better to forestall trouble when it is possible to do so by the addition of mud materials over a considerable period. Hurried addition of materials may cause overtreatment, chemical and colloidal additives will be wasted and a remedy for overtreatment will need to be devised. Tests should be made on small samples to determine the effect of any treatment before it is inaugurated.

The high-temperature decomposition of phos-

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phate-treated muds may be prevented by the use of dicyandiamide. The action of this chemical is not clearly understood at present although good results have been achieved with it.

It was also brought out that often rather simple treatments or changes in the mud system achieved the desired results. In one case when trouble with lost circulation was encountered, the vibrating screen was bypassed. This allowed the larger particles to settle out in the pits while the smaller ones were recirculated and gave the necessary particle size to plug the formations.

Discussions on the paper by I. W. Alcorn, Pure Oil Co. and W. A. Alexander, Shell Oil Co., Inc., Houston, were presented by T. A. Huber, Humble Oil & Refining Co., Houston; E. O. Bennett, Continental Oil Co., Ponca City, Okla., and D. D. Braugh, Sun Oil Co., Beaumont, Tex. Mr. Huber raised the point that the interest on the investment deferred by a two-zone completion as against individual wells was sufficient in 3 to 5 years to take care of the additional cost of abandoning the multizone well and drilling a second. If it were possible to determine the difficulties to be encountered during the later life of the wells at the time of completion, the problem would be simpler, according to Mr. Huber. He added that multizone production brought with it a new series of mechanical problems.

Mr. Bennett commented that with only 90 days supply of steel for oil-field use, the multizone completion method is of great importance, saving as it does 45 per cent of the steel required for individual wells. No serious difficulty has so far been encountered in wells pumping from two separate zones. Paraffin troubles are not bad and are easily cured. The cementing problems encountered in multizone wells are no worse than in wells completed in a single zone. He added that while a two-zone well costs a little more to complete and operate, the per-barrel costs are much lower. Two-zone completions in a single formation has great possibilities, particularly in pressure-maintenance wells.

D. D. Braugh commented that the recording of factual data from the start of a new method was of great importance and made possible the evaluation the particular method.

E. E. DeGolyer, assistant deputy petroleum coordinator, urged in his talk, "Conservation, a Practical Problem," the application of the best production practices in present operations. He said that the nation was rapidly approaching a scarcity of oil and that it was now only a matter of months before no surplus productive capacity will exist. Before long, he said, the production of the needed 3,800,000 bbl. of crude oil per day will depend on the supply of men and material. The nation is short on recent discoveries and prospects and is losing on its reserve balance.

Mr. DeGolyer urged unitization of properties as a means of conserving material and men and prolonging the productive life of the fields. It has many advantages and should be given more consideration than it has received in the past. The wasting of gas is a major problem and in some states the failure to utilize it amounts almost to a crime.

Joe Zeppa, Delta Drilling Drilling Co., Tyler, Tex., reviewed the salt-water problem in the East Texas field in his paper, "Pressure Maintenance by Injection of Produced Salt Water in the East Texas Field." The present plan is to increase the return of water to the producing horizon through the facilities set up under a cooperative project. This cooperative includes 349 stockholders with a capitalization of $2,000,000.

There are now 25,500 wells in the field and approximately 5,000 of them produce salt water in some quantity along with the oil. Approximately 1,300 of the water wells are in the problem class, producing approximately 390,000 of the 435,000-bbl. salt-water production. Approximately 700 of the wells produce 280,000 bbl. of water per day.

The salt-water injection plant will go into operation next year. If 150,000 to 200,000 bbl. of water can be shut in, the field, which is now producing at its optimum capacity, can increase its output without reducing the bottom-hole pressure. Present plan is to shut in the big water wells and transfer their allowables to other areas not troubled with brine. The shut-in wells will be allotted production on the basis of decline curves and when the allowable gets to zero the well will be considered as abandoned.

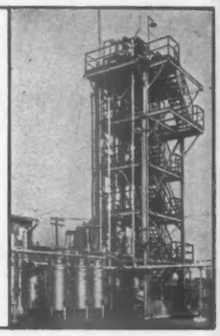
It will be necessary to keep the leases in force during this period and it will be necessary to pay double royalty on the production allocated to the shut-in wells. However, the reduction in lifting and water-handling costs will more than compensate for the additional expense.

Paul D. Torrey, consultant of Houston, Tex., and chairman of the standing subcommittee on secondary recovery, discussed the role of this method of production in the present war effort. Location of many of the operating and potential secondary-recovery projects is extremely important as they are mostly in areas where the demand is strong. The increase in production through the application of water flooding and gas drive is an important source of revenue to the states and they should encourage such development.

All committees while reporting on the progress of various programs under way also emphasized the importance of war work. Practically every one of them reported that all new work was directed toward increasing the supply of oil available to the nation during war.

CHEMICALS *from* PETROLEUM

By W. T. ZIEGENHAIN



AROMATICS

NEVER before has petroleum been so thoroughly combed for fractions having unusual characteristics. At present, the aromatics, which are the hydrocarbons containing the benzene ring, are sought with great interest. The simplest in the group are toluene, benzene, and xylene. They have direct commercial value as industrial war materials and already substantial amounts of money have been spent to augment their normal output.

Each of these named has been reported as present in crudes produced in many parts of the world but the percentage of aromatics is reported highest among the asphaltic crudes and especially among certain crudes produced in Borneo. Whether the toluene and other aromatics contained in these crudes and now controlled by Japan, is of current commercial value is, of course, not known.

It is significant, however, that substantial quantities of toluene, benzene, and xylene are being synthesized in the United States from petroleum and this could be expanded almost at will, depending upon the availability of the plant equipment to make the conversion.

The properties of toluene are comparatively well known because general recognition has been given the importance of toluene as a base material for the manufacture of trinitrotoluene, the latter being better known as TNT. But equal publicity has not been given the general subject of aromatics being used as superior motor fuels. The 115-octane and the 125-octane gasolines that have been mentioned from time to time are products of aromatization. It is equally well known that aromatics are available from petroleum which have octane blending values well in excess of these figures.

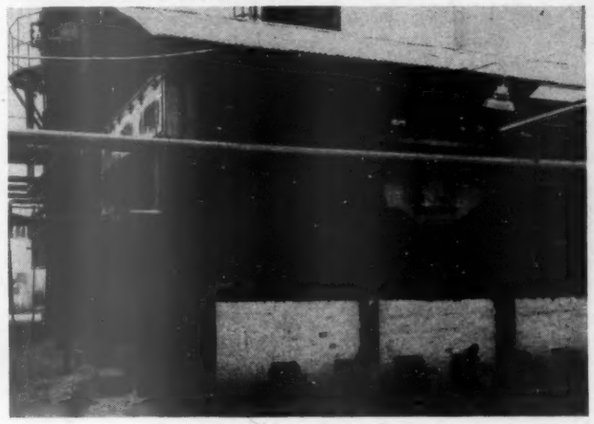
The natural question to follow is "Why do we not now make these fractions in large quantities and use them as aviation gasoline?" The answer is "We will when needed." Apparently, authorities now agree as to how the materials might be made in large quantities and are reasonably prepared to do so if and when the airplane engines demand them. In the meantime, research continues in anticipation of cutting manufacturing cost. Their production, according to present known methods involves the use of relatively high temperatures. Authorities have reported the practical range to be from 1,100° to 1,500° F. They designate "vapor phase" cracking as most productive of aromatics and also report relatively high yields when the cracking is carried out with great "turbulence." As charging stock, they prefer petroleum distillates, especially the relatively light cracked-gasoline fractions.

Research in the natural-gasoline field has also shown that commercial yields of aromatics can be recovered by aromatization. The degree of conversion, is of course, dependent upon the relative proportions of unsaturates present in the gasoline and their specific nature. Conversion of the straight-chain light hydrocarbons present in natural gasoline to desirable aromatics has involved the dehydrogenation of the saturated simple aliphatics to olefins by the use of a catalyst, a relatively high temperature and relatively low pressure. The olefins formed are then subjected to relatively low temperatures and relatively high pressures and in the presence of another catalyst, under which conditions, polymerization takes place. The polymerization step utilizes temperatures in the range of 1,080° to 1,170° F. and pressures between 450 and 750 lb. per sq. in. Aromatic hydrocarbons can be made outside these ranges but authorities report declining yields when higher pressures are used in the polymerization step.

Also, in the practical application of aromatization to straight-chain petroleum fractions, the researcher is faced with using metals commercially available for heating the gases and since temperatures of 1,200° to 1,500° F. are needed the problem is not simply one of refining.

Refinery IDEAS ... that save $ $ $

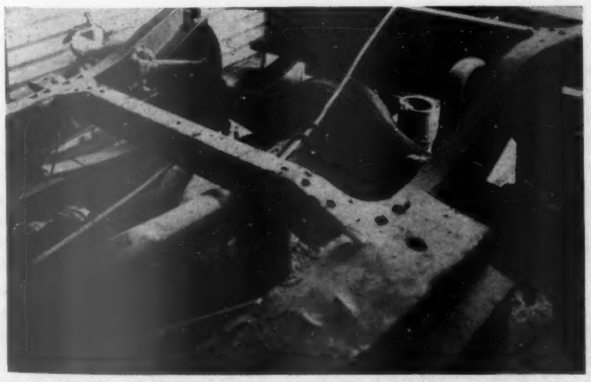
Heater From Salvaged Material



Need for additional capacity at an asphalt plant was provided by the installation of the furnace shown here. Faced with inability to get all the steel originally thought necessary for its construction, the company early set out to salvage and buy as much second-hand material as was available in the surrounding country. Every part of the furnace is standard, but at least 75 per cent of the items were salvaged.

Auto Engine Powers Asphalt Mixer

Although the arrangement shown here may be only temporary, this automobile motor and driving mechanism supply power to an asphalt-mixing tank. In the tank, a heated asphaltic oil and solid filler of one kind or another are mixed to a thick consistency and then supplied



to the trade as an asphalt-impregnated solid. The rear of the chassis is shown here together with the extension of the one shaft through the side of the building. This shaft, of course, supplies power to the mixer. The other axle has been anchored so that the power of the motor is delivered to the mixer through the automobile differential and right rear axle. Another interesting feature is that the parts of the chassis have been kept practically intact and the entire assembly has been supported on concrete blocks into which portions of chassis are imbedded.

Barrel Elevator Utilizes Manpower and Little Metal

It is an easy matter for a refiner to build a wooden frame and platform for a barrel elevator, even though metal parts are scarce. But to provide a means of raising and lowering the platform without the use of considerable metal is a real problem. It was solved here by the old spool method of winding a cable around a small shaft at one end of which is a continuous belt running over a large wheel that permits of great leverage. The horizontal shaft on which the ½-in. cable is wound is only 3 in. in diameter, while the wheel over which the continuous rope passes is 4 ft. in diameter. The leverage provided by a man pulling the rope could easily permit the lifting of 1,000 lb.

Boiler Blow-Down Tank Saves Operating Time

In a plant where water is plentiful, and the primary consideration is to keep the equipment busy, it was found expedient to install a yard boiler-blow-down tank to take the hot mud and water drainings of each boiler as each boiler cleaning became necessary. The blow-down tank was partly imbedded and was equipped with a stack and sewer outlet. When a boiler is to be cleaned, the contents are blown to this tank. It was purposely made large to handle all the water and mud that would come from any boiler. Therefore, any boiler can be emptied and then refilled and fired while the water and mud are draining from the tank. The stack is long and exposed to cause it to be kept relatively cool. It therefore causes much of the steam to condense and fall back into the tank. This water mixes with the boiler mud and keeps it fluid so that it can be removed from the tank more readily in continuous flow.

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

W. L. NELSON

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to W. L. Nelson, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists, and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible. Inquiries must be signed but only the given initials will be printed. The source of the question is considered to be confidential.

Questions requiring a discussion of patents, extended computations, or a detailed study cannot be considered. When the matter is of general interest, a reply will be published within a reasonable time.

Ethylene a Major Raw Stock for Chemicals

In your petroleum chemical industry what particular material in our refinery can be used? We operate a small topping plant with a cracking plant on a Mid-Continent 38-gravity crude oil.—J. N. B.

The manufacture of chemicals from petroleum products is highly complicated. Not only can many reactive hydrocarbons be used but a large number of products are possible from almost any of them. In general, such hydrocarbons as the olefins (ethylene, propene, butene, etc.), diolefins (butadiene, isoprene, piperylene, etc.), or aromatics (benzene, toluene, stryene, propyl benzene, etc.), can be used and all of these are produced by high-temperature cracking with or without catalysts. Unfortunately, no single one of these materials can be produced to the exclusion of the others and hence the manufacture of chemicals cannot be approached from the standpoint of utilizing a single chemical unless a large processing cost is justified. Furthermore, many chemical products tend to be produced, as will be emphasized below for ethylene, and hence the manufacture of chemicals must be approached on a somewhat large scale by which several hydrocarbons are employed as a charge stock and by which several chemical products are produced. This type of manufacturing operation obviously grows into a complicated one which involves many processing operations and the securing of many types of market outlets.

Perhaps the most readily available hydrocarbons in a refinery operating with a cracking plant, are the ethylene, propylene, and butylene hydrocarbons that are found in cracked gas. These can be polymerized, alkylated, etc., by processes already well developed for the manufacture of gasoline but they can also be used for numerous strictly chemical processes.

Ethylene is probably the most abundant of these materials and hence an attempt will be made here to illustrate a few of the many ways in which ethylene can be utilized. It may be polymerized with itself or other olefins (propene, butene, etc.) to give gasoline-like products such as poly gasoline. It may be combined with benzene by a high-temperature catalytic process to produce ethyl benzene which in turn may be dehydrogenated to produce styrene. Styrene along with butadiene constitutes the major raw stock for the manufacture of buna-S synthetic rubber. Other uses of ethylene for the manufacture of specific chemicals have been described in recent issues of this page in The Oil and Gas Journal as follows:

Ethylene chloride—July 30, 1942, Page 168.
Grain alcohol—July 23, 1942, Page 40.

The first operation in the conversion of ethylene into one set of similar organic chemicals is the formation of the compound ethylene chlorohydrin. One procedure for making this compound is to simultaneously pass ethylene gas and chlorine gas into water. The ethylene chlorohydrin that is produced is soluble in the water and may be removed by distillation. The chemical reaction may be considered as composed of two steps:

(1) $Cl_2 + H_2O \rightarrow HOCl + HCl$

(2) $H-C=C-H + HOCl$ (H, H)

$\rightarrow H-C(OH)(H)-C(Cl)(H)-H$ (ethylene chlorohydrin)

The primary use of this product is as a disinfectant or insecticide. Other suggested uses are as a refining agent for rosin in making glazed paper and as a solvent agent for extracting naphthenic materials from crude oil.

The chlorohydrin may be further changed by the use of caustic into a material known as ethylene oxide which in turn is a parent compound in the manufacture of many organic chemicals. The reaction when ethylene chlorohydrin is heated with caustic may be written as follows:

$H-C(OH)(H)-C(Cl)(H)-H + NaOH$

ethylene chlorohydrin — sodium hydroxide

$\rightarrow H-C(O)(H)-C(H)-H + NaCl + H_2O$

ethylene oxide — sodium chloride — water

Ethylene oxide may be converted into the familiar ethylene glycol or antifreeze compound by adding to it an excess of slightly acid water.

$H-C(O)(H)-C(H)-H + H_2O \rightarrow H-C(OH)(H)-C(OH)(H)-H$

ethylene oxide — water — ethylene glycol

This substance has also been widely used as a solvent, resembling grain alcohol in its general solvent properties. Along this line it has been suggested that it be used as a solvent for gum-forming compounds.

Another chemical derived from ethylene oxide is the compound triethanolamine which is used in treating natural gasas to remove H_2O (Girbotol process). This is formed by the action of ammonium hydroxide or ethylene oxide.

These several illustrations by no means exhaust the possibilities in the way of utilizing ethylene, and in fact literally dozens of similar reactions might be tabulated.

Analytical Procedures For War Industries

Numerous inquiries concerning analytical procedures for determining the chemicals and hydrocarbons that are involved in the petroleum war industries have been received, such as toluene, butadiene, isobutylene, ethyl-benzene, impurities in these materials, etc.

Although many of these procedures are well-known to the Axis Powers, in some instances it is believed that our procedures are superior. For this reason, the Petroleum Industry War Council believes that the procedures should not be publicized, and that those organizations entitled to receive such information can be served by applying directly to Secretary K. G. Mackenzie, of the Petroleum Industry War Council (synthetic-rubber committee), 135 East Forty-second Street, New York City, or the local refining committees of the five petroleum districts.

Our loyal citizens do not wish to be responsible for any secrets that may by carelessness or otherwise become useful to the enemy and hence the above arrangement should be satisfactory to all. Nevertheless, the Petroleum Industry War Council must be certain that it is not hampering the ability of the industry to contribute to the war. Two examples regarding toluene come to mind. In these instances local operators have found crude oils which by some analytical methods contain commercial amounts of toluene. OPC analytical methods are not available to these operators until they have contracts to produce toluene and yet contracts cannot be awarded until the method of determination used by the applicants is suitable to the OPC. Certainly facilities for avoiding such an impasse must be provided by the Petroleum Industry War Council because the time and energy of our people or chemists must not be squandered at this vital time, nor can our country fail to avail itself of the knowledge of local operators who together know more about the crude oils of our nation than any governmental agency or any single oil company.

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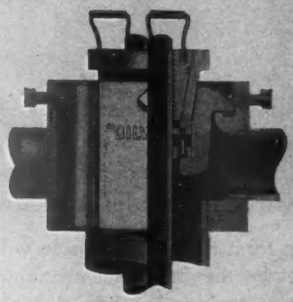
Simple and compact with low overall height . . . Parts and stuffing-box rings interchangeable through entire range of tubing sizes . . . Constant compression of packing by strong interchangeable spring . . . Extra-long top gland . . . Large oil reservoir.



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(Illustrated with "Oilwell" Slip-Suspension Tubing Hanger—Type "C")

Convenient octagonal body with straight sides and low overall height . . . Eight set screws help distribute pressure on packing . . . Semi-steel or cast-steel to suit well requirements.

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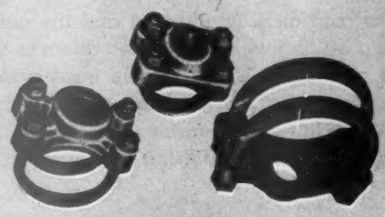

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Drop-forged steel bodies *fit the pipe accurately* . . . One-, two-, and three-slip styles with round or flat slips . . . Wide range of sizes with tapped or blind outlets.

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From pumping units to stuffing-box rings

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WHEN you put a piece of equipment on a well, you want to know that it is worth its salt—that it will give you its full share of reliable service. The quality that results in just that kind of performance is built into all "Oilwell" production equipment, from the largest item of machinery to the smallest part or accessory. All "Oilwell" products receive the same careful attention to design, material and workmanship.

Illustrated on this page are a few of the many items comprising "Oilwell's" extensive line of production equipment. The next time you're planning the equipping of a well or an entire lease, stop at the nearest "Oilwell" store. Friendly, competent supply men will gladly show you what they can furnish for your particular applications.

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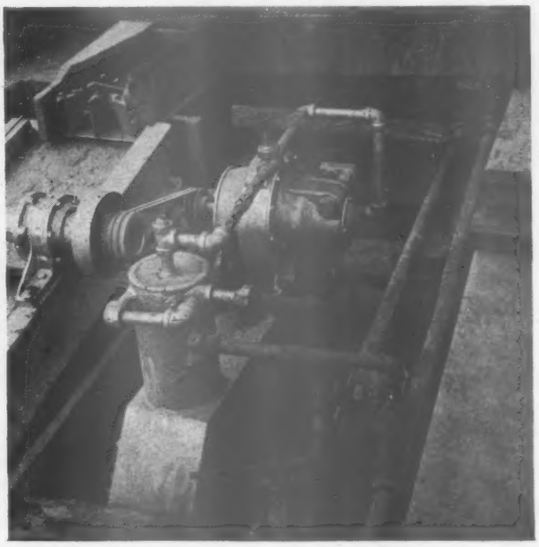
Operating Ideas

Water Trap For Shale-Shaker Turbine

To prevent slugs of water that might be carried in the steam line from getting into the turbine used to drive the shale shaker on a drilling rig, a Gulf Coast operator placed a small trap, or separating device, on the steam line just ahead of the turbine, mounting it on the shaker frame. Steam enters this device at the top through a connection tangent to the cylindrical body of the trap and is taken out through an opening in the center of the top. The water carried in with the steam is separated from the steam by the whirling motion given it, and settles to the bottom. A drain pipe, installed at one side, is provided with nipple on an elbow so that it just clears the bottom of the cylinder. By opening a valve in the drain, steam pressure within the device forces the water out, the valve being closed when steam is heard blowing around the base of the nipple.



Simple Support For Preventer Control

A simple, yet substantial support for the manual control-arm extension of a blowout preventer consists of a section of 2½-in. tubing of sufficient length to reach from the derrick floor to the base crossmember of the substructure. The ends of the section are flattened and bent at 90° to form feet for bolting to the derrick floor at the top and the substructure base member at the bottom. The tubing section is perforated with a series of holes so spaced as to fit the span of a U-bolt which supports and fastens the preventer arm extension to the upright tubing section.

"Eyeless" Retainer Holds Catline in Place

A unique guard to keep the catline from swinging across the derrick floor has been devised on a rig operated by a Texas drilling contractor. Unlike the eye usually provided for this purpose, the device, which is welded to the sheave support, does not require threading the line from the end. Two hooks are formed with shanks long enough to stand out beyond the rim of the sheave when welded to the supporting frame. One hook is faced to the left and the other to the right. The two

combine to form a retaining circle with the sheave rim to prevent the line from swinging out of line. To remove or replace the line, it is carried around one hook end, through the space between the two, and then around the free end of the other. The shanks of the hooks are welded close to the sheave and serve as guides to prevent a slack line from becoming pinched between sheave and guard.

Innertube For Mud-Line Connection

When a mud ditch is not used and the mud return line on a drilling well is extended direct to the shale shaker considerable vibration is transmitted to the shaker, particularly in the case of a slim-hole mast job. An Oklahoma operator eliminated this vibration on the shaker by utilizing a section cut from an

old innertube from a truck tire as one of the couplings in the line. The mud line was of slightly greater diameter than the inntertube so that when the ends of the tube were stretched over the connecting ends of the line they fit snugly providing a seal against leakage.

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

STANDARDIZATION

NOVEMBER 19, 1942

LARGE SAVING MADE POSSIBLE BY EQUIPMENT STANDARDIZATION

THE present war has proved the value of the standardization program which the industry has carried on over the past 15 years (mainly through the A.P.I.) through which it reduced the number and types of items used in petroleum operations. Generally, this program has consisted of specifying the design of the parts of various items of equipment so that maximum interchangeability is obtained. Many producing operations would already be shut down if it had not been possible to take parts from the pump of one manufacturer and install them on a pump of another brand.

By using standard types of construction, numerous delays due to failure of parts to fit, are eliminated. The shut down of a crew because two items to be connected did not have the same type thread rarely occurs now. There are still fields left to conquer in the name of standardization but generally speaking the improvement during the past 10 years has been remarkable.

More important is the standardization of operations within the individual companies as it affects materially the profits of the organization. The money saving through such a company program is difficult to estimate because it affects so many departments and functions in the conduct of an oil business.

Most of the larger companies have such standardization programs as it naturally follows the pattern of such organizations. One large system of retail grocers, for instance, builds all of its stores to the same plan; a customer of this system feels as much at home in Wichita, Kans., as he does in Houston, Tex. A large nation-wide service company catering to the general public standardizes not only on the equipment used but also on the tools and trucks necessary to maintain it. Each truck is the same and is equipped in the same manner. If a workman needs or could have profitably used a certain tool on a job, a request is forwarded through the proper channels and after so many calls for the particular item, it is adopted as standard equipment.

The larger oil companies generally standardize on a system for a general area and then on several brands of equipment to be used there. Outstanding superiority of an item will naturally lead to its adoption. The use of several brands is primarily due to the desire of the oil companies to maintain a virile supply industry which would be impossible if one supplier was permitted to monopolize the business. A large operation by a single company will see a half dozen different brands of pumping units, engines, motors, etc., in use. They are able to do this practically without penalty as a fairly large stock of replacement parts is necessary to begin with and dividing up the total stock of one type item into several different brands does not present a problem or add appreciably to the cost. The use of each type item is generally concentrated in districts so that the maintenance problem is simplified.

Smaller companies in following a standardization program either buy all equipment of one make or concentrate on standardizing on items. Again, the latter program allows a distribution of the company's purchases among a number of suppliers. Tubing will be one manufacture, casing another, well head another, pumping units another, etc.

The standardization on one item permits further simplification of other equipment and jobs. Selection of a particular brand and size of pumping unit allows design of a foundation to be used on all wells. The choosing of a particular type and size engine or motor to be used on a pumping unit automatically provides the necessary facilities for installing a replacement in case it is necessary.

Outstanding is the simplification and the reduction in cost of the repairs of the individual item. Such work is on a near mass-production basis as the men are familiar with the equipment and can take it apart and reassemble it quickly. The repair crew learns what can and cannot be overhauled profitably. Highly specialized equipment which can do a particular job in a very short time can be installed if the volume of work justifies it. One company, using one type engine in its operations, has special equipment for refacing the valves and seats which saves important time and money. If a number of different engines were used, more widely adaptable and slower valve-facing equipment would be needed. Where periodic reconditioning is required, the standardization program pays even bigger dividends.

The supervisory and maintenance force is naturally reduced by standardization as the necessary work can be done quicker. The superintendent needs to remember only a few sizes and specifications and can order replacement parts from memory or with a glance at a catalog.

The performance of special equipment can be quickly checked by running it on representative installations and its suitability for adoption determined. A system for its inclusion in the working arrangement can then be devised and unnecessary shutdown time while alterations are being made eliminated. A company recently picked a certain type coupling for use between engine and pump after trying out a number of different manufacture. From its tests it was determined that for the particular equipment involved, that coupling was the most satisfactory.

Probably the greatest money saving under present conditions is the training of personnel to operate the equipment and the increase in the number of installations which one man can operate. A new employe can be thoroughly instructed on the operation characteristics of the machinery in a comparatively short time if all installations are identical. Danger of damage to the machinery due to lack of familiarity is eliminated. A relief pumper on a strange lease is already familiar with the operation.

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CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL PUMPING

NOVEMBER 19, 1942

ADDITIONAL ENGINE EQUIPMENT ELIMINATES DOWN TIME

ECONOMICAL operation of producing properties often depends on the equipment running 24 hours a day. This is particularly true in areas which are not under proration and which have a high productive capacity. Where rigid proration is enforced, the economics changes slightly and one may not be justified in going to extra expense to prevent down-time losses. Production not obtained 1 day, or in 1 week, may be regained in a subsequent period, after the machinery has been repaired and put back in operation.

However, under certain producing conditions in prorated areas the 24-hour operation of an engine is essential. When the wells are pumped with a geared or band-wheel power or by electric motors with the current furnished from a centrally located genrating plant, the pumping periods of the individual wells are staggered so that the prime mover operates all the time with the exception of the shutdowns for greasing and necessary servicing.

If an engine could be depended on to run without interruption, or if it did not have to be checked for oil, etc., the use of a starter might be unnecessary. There are, however, a number of contingencies which may arise which will cause the engine to stop. When an engine is new, the starting of it is a comparatively easy task, requiring only the proper adjustment of the spark and fuel mixture and a jerk on the crank or flywheel. After the engine has been in service a while, cranking is no easy matter and often the pumper must seek assistance in getting the engine to running again.

A comparatively simple and inexpensive starter can be installed on a horizontal engine for a moderate sum, around $80. It is evident that not much shutdown or overhaul and cost need to be eliminated to repay this small investment.

One such starting device is the impulse starter which consists essentially of a small internal-combustion-engine driven air compressor, a steel mixing flask or chamber and the proper control valves. Gas is admitted to the mixing flask to a certain pressure and then air forced into the flask to a still higher predetermined pressure at which a perfect mixture for explosion is in the chamber. The flywheel is then turned to the point where the piston is just ahead of the firing position and the mixture admitted to the cylinder. Kicking the flywheel to the point where ignition fires explodes this mixture and starts the engine. The small engine and compressor cost around $50 and the flask and necessary connections can be obtained for around $30.

Another device which can be added to any engine is a dual ignition system instead of the common single ignition generally found. Most engines are equipped for a second set of spark plugs and if not the holes can be tapped in the cylinder head. The engine will have a greater horsepower output per unit of fuel used due to the better and more even combustion, will run cooler, and will show a lower maintenance course. More important is the fact that in case one plug fouls out or a magneto goes bad, the engine is not shut down but will continue to run on the remaining ignition system.

A dual ignition can be installed on a single-cylinder horizontal engine for around $100 and if 24-hour-per-day operation is desired it is a good investment. The magneto itself can be purchased for around $35 and the drive, impulse, sprockets and other modifications will cost in the neighborhood of $65. Where continuous operation is not a practical necessity, a dual ignition need not be added to the older engines.

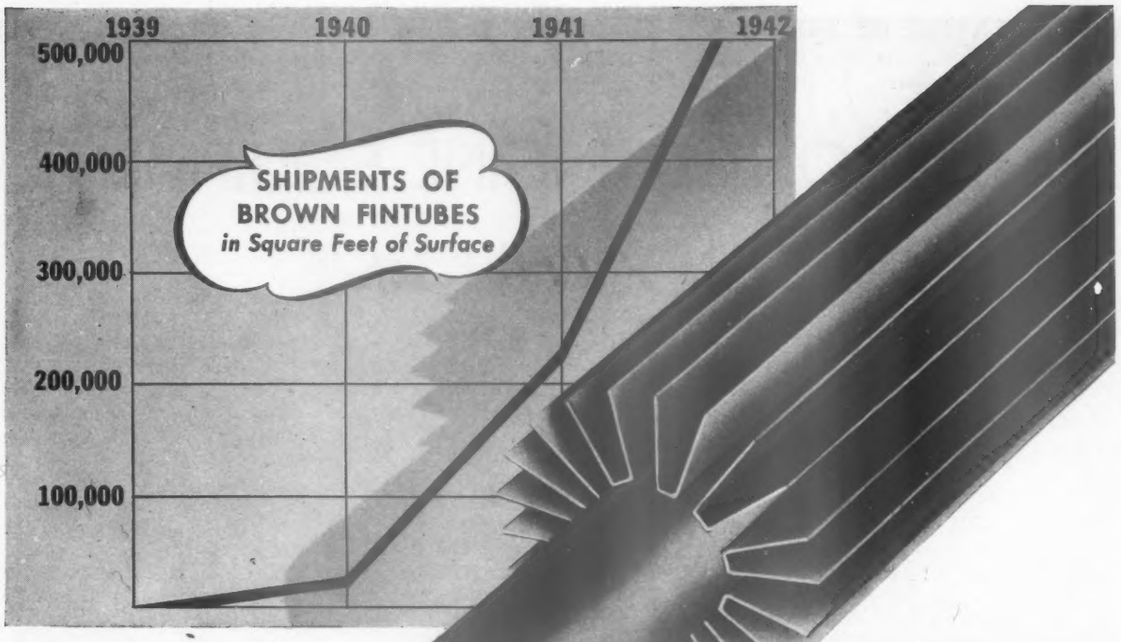
The familiar neon tubes for testing ignition circuits on engines are also a valuable and money-saving addition to an engine. The small screwdriver type with which the ordinary automobile ignition is tested is the one most commonly seen. The neon tube in a little different style can be permanently installed on an engine and will pay big dividends.

A type designed for service on industrial engines can be purchased in quantity lots for around 35 cents each; cheaper ones costing as little as a few cents may be obtained but the heavier duty type justifies the additional small investment.

On a magneto-equipped engine the insulated clips are attached to the engine and the neon tube shunted on to the circuit; battery ignitions require grounding of the tubes. Every time the current for firing the charge in the cylinder passes through the wire to which the tube is attached, it flashes. A glance at the engine will tell whether its ignition system is functioning satisfactorily.

Elimination of down time is again the principal factor. The pumper in checking the engine operation can diagnose trouble by the flashing of the tubes. If one tube fails to flash, the spark plug is bad; if two tubes are not flashing the magneto is not functioning. Knowing this, the pumper does not stop the engine and make the repairs but continues it in operation on the second ignition system until the time for the servicing of the engine. If the magneto is bad the engine-repair man can be summoned and all work possible done toward making the replacement before the engine is stopped. The pumper does not have the tendency to remove a plug from the engine and throw it away simply because he thinks it is not operating properly. With the dual ignition and the neon tubes, one of the most common causes of engine shutdown, ignition trouble, is practically eliminated.

Spark trouble is generally reflected by an abnormally high number of shutdowns recorded on the engine charts or on the pumping schedule. Generally, high spark-plug-replacement rates are due to using a plug unsatisfactory for that type engine. Use of a colder plug has been found effective in eliminating this type of trouble. Another source of difficulty is the ordinary copper and asbestos ring, used for a gasket under the plug, which does not allow the heat from the plug to escape into the engine head and cooling system. Change to stainless steel gaskets will often eliminate much spark trouble as the heat transfer is not impeded and the spark plug does not fail from too high temperature.



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THE BROWN FINTUBE CO.

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 51

NOVEMBER 19, 1942

SETTING PISTON-TYPE STEAM ENGINE SLIDE VALVES

PRACTICALLY all modern steam engines used in oil-field service are equipped with piston-type- inside-admission, slide valves.

In general the angle of advance of a steam engine is fixed by the design of the engine and cannot be changed in the field. The setting operation described in the outline (part *B*) of Installment 50 will hold true for the piston type of valve as well as for the D-slide valve, in so far as the general principles are concerned. The purpose of this installment, however, is to describe special means that may be applied in taking measurements to determine the lead on each end of the cylinder when using the piston-type valve.

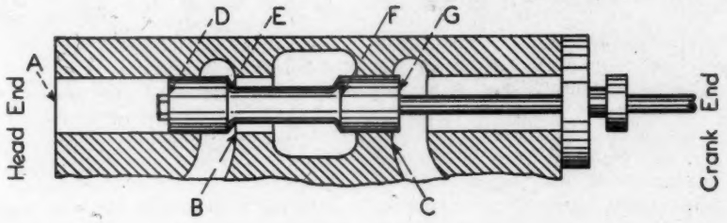


Fig. 1

In Fig. 1 is illustrated a valve of this type. The method of taking measurements to ascertain lead will now be outlined. First, the steam-chest cover is removed and some reference point at the end of the valve seat, such as the edge *A* in Fig. 1, is chosen from which to take measurements. The edge *A* is so chosen that it will not be covered by the valve at any time during the valve motion. The valve can now be removed from its seating space and the distances *AB* and *AC* measured. *B* and *C* represent the admission edges of the valve ports for the head-end and the crank-end respectively. A specially made measuring stick, as illustrated in Fig. 2, may be used for measuring these distances. The distance *AB* in Fig. 1, for example, can be measured (with valve removed) by inserting the stick so that the edge *M* of the steel head is against the edge *B* of the valve port. A mark is made on the stick coincident with edge *A*, the measuring stick removed, and the distance between the mark and the edge *M* measured with a steel scale. Similarly, the distance *AC* can be measured by contacting the edge *N* of the steel head of the measuring rod with the edge *C* of the valve port.

The lengths of the seating surfaces, *DE* and *FG*, of the valve can be measured with a steel scale while the valve is removed from the chest. At the same time the length between the inside edges of the valve, *EF*, should be measured.

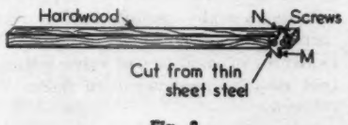


Fig. 2

Now the valve may be placed back into its seat, and the record of the measurements outlined above can be applied in determining the lead on each end of the cylinder, after measuring in each case the distance from *A* to the edge *D* of the valve.

Example

Problem.—Referring to Fig. 1, measurements taken by removing the valve are as follows:

AB=9 in.; AC=16 in.; FG=2⅜ in.; DE=2½ in.; EF=6 in.

Calculate:

1. Head-end lead indicated when measurement *AD* (Fig. 1) is 6⅝ in. with engine on head-end dead center.

2. Crank-end lead indicated when measurement *AD* (Fig. 1) is 7¾ in. with engine set on crank-end dead center.

Solution:

1. Head-end lead = $AM-(AD+DE)$ = $9-(6\frac{5}{8}+2\frac{1}{2})=9-8\frac{1}{8}=\frac{1}{8}$ in.

2. Crank-end lead = $(AD+DE+EF)-AC=(7\frac{3}{4}+2\frac{1}{2}+6)-16=16\frac{1}{4}-16=\frac{1}{4}$ in.

It is advisable, wherever possible, to obtain a set of manufacturer's instructions pertaining to valve setting on the particular engine with which one is concerned. One manufacturer in particular adjusts the valves on each engine at the factory using a steam-engine indicator, the adjustment being so made that equal work will be done on each end of the cylinder. At that time markings are placed on the steam chest and valve stem so that the operator can duplicate the setting previously established at the factory.

The steam drilling engine is constructed in such a way that the direction of rotation can be reversed instantaneously. The simplest means by which this reversing is accomplished consists of using two eccentrics connected by a linkage to the valve in such a way that either of the eccentrics can operate the valve depending upon the position of a hand-operated reversing lever. One eccentric is set in such a position that when it operates the valve, the valve events will so happen that the engine will run in a forward direction; whereas the other eccentric moves the valve events so that the engine is caused to operate in the reverse direction. It is more important to have the valves set properly for the forward motion than for the reverse motion, since the engine will run forward when under load. This should be kept in mind if necessary for a slight error in valve-setting for one motion or the other.

Twin-cylinder drilling engines commonly have independently operated valve gears for each cylinder. Although in a sense the two cylinders may be considered as separate engines, there must be proper correlation, as determined by valve-setting, between the two cylinders, due to the fact that the two pistons drive a common crankshaft and are controlled by one reversing lever.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 52

NOVEMBER 19, 1942

D-SLIDE VALVE SETTING FOR EQUAL CUTOFFS

ALTHOUGH slide valves are more commonly set for equal leads as described in Installment 50 of this series, the setting is sometimes made for equal cutoffs.

The method of setting for equal cutoffs, as applied to an engine with the eccentric set-screwed to shaft, is outlined in the following steps:

1. Select the percentage of the stroke at which it is desirable to have cutoff occur for both ends of the stroke. For most slide-valve engines, this will vary between 60 and 85 per cent of the stroke. That is, head-end cutoff should occur when the piston has traveled 60 to 85 per cent of the distance from its head-end dead-center position to its crank-end dead-center position; and crank-end cutoff should occur when the piston has traveled 60 to 85 per cent of the distance from its crank-end dead-center position to its head-end dead-center position.

2. Mark positions of the crosshead on the crosshead guide which represent the positions of the piston at the desired cutoff for each end of the cylinder. This may be done for the head-end by setting the engine on head-end dead center and making matching marks (*A* and *B*, Fig. 1) on the crosshead and guide. From the mark *B* on the guide a distance equal to the desired percentage of the stroke is measured toward the crank-end dead-center position of the crosshead and another mark *D* placed on the crosshead guide at this point.* Then when the engine is turned in its normal operating direction until the mark *A* on the crosshead exactly coincides with the mark *D* on the guide, the desired position has been attained. Similarly, the desired cutoff position may be located for the crank end of the cylinder by making mark *C* to match mark *A* when the engine is on crank-end dead center, measuring the distance *CE*, and then turning engine until marks *A* and *E* coincide. The distance *CE* is determined by multiplying the desired cutoff percentage by the length of the piston stroke. If equal cutoffs are desired, naturally this percentage will be equal to that used on the head end.

3. Place the engine on one dead-center position and, by loosening the eccentric on its shaft, shift the eccentric to obtain an angle of advance of about 45°.

4. Turn the engine in a normal operating direction until it is at the desired position of cutoff located in Step 2.

5. Remove the steam-chest cover and lengthen or shorten the valve rod until the cutting-off edge of the valve just coincides with the cutting-off edge of the valve port. (See valve position in Fig. 2, Installment 49, for head end.)

6. Turn the engine in its normal operating direction until the piston is at the desired cutoff position for the other end of the cylinder, and measure the amount by which the cutting-off edge of the valve fails to coincide with the cutting-off edge of the port for that end of the cylinder.

7. Lengthen or shorten the valve rod, as required, to correct one-half of the error, and rotate the eccentric on the shaft to correct the other half of the error.

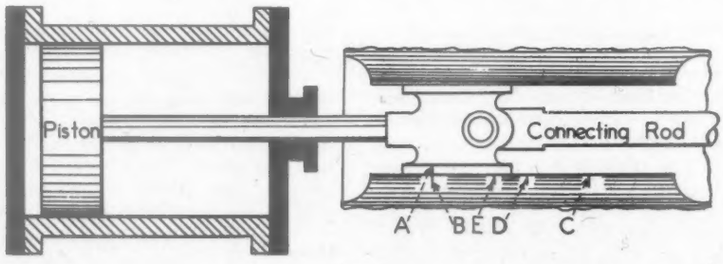


Fig. 1

8. Place the engine again at the cutoff position for the other end of the cylinder. Eliminate half of any error by adjusting the length of the valve rod, and remove the other half of the error by shifting the position of the eccentric on its shaft.

9. Now set the engine on each dead-center position and measure the lead in each case.*

10. Turn the engine so that the valve is at each extreme end of its travel and measure the position of the valve center with reference to the valve seat.

11. From dimensions of the valve, the valve seat, and the ports (presumably already known and recorded), calculate the head-end and crank-end exhaust and steam laps along with the maximum port openings for each end of the cylinder. This step and Step 10 represent merely a possible check to determine how nearly the various items are balanced between the two ends of the cylinder.

12. Tightly lock all adjusting nuts and set screws and replace the steam-chest cover.

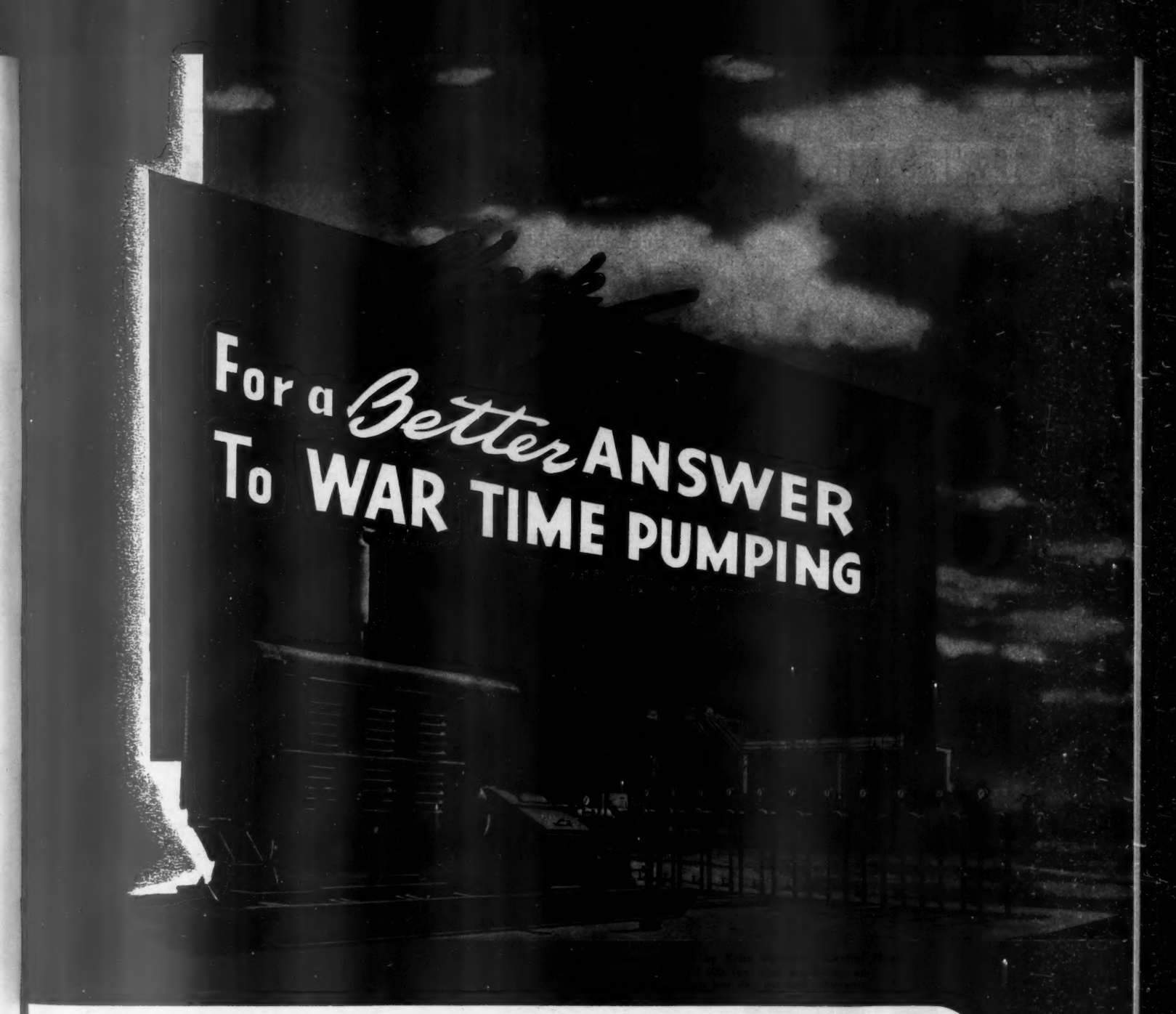
13. Take indicator diagrams on each end of the cylinder, to detect any evidence of the need for minor adjustments.

The above adjustment, if properly carried out, should give a fairly close balance or agreement as between corresponding events of the two ends of the cylinder. The last step outlined, i.e., use of the indicator, is the ultimate test to determine if a successful setting has been obtained. In fact, less systematic cut-and-try methods using the indicator may be used to obtain just as good results, and the operations outlined above dispensed with. Such trial procedure, however, often proves to be more laborious and time-consuming unless handled by one particularly adept at diagnosing engine operation from indicator diagrams. Discussion and drawings in the next installment will point out some of the evidences of good or bad valve setting that may be recognized on indicator diagrams.

*For example, if an engine has a 12-in. stroke and it is desired to have cutoff occur at 60 per cent of the stroke, this measured distance would be 0.6 × 12 = 7.2 in.

*Lead was defined in Installment 50.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma



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Pipe-Line Activity

Negotiations for Feeding War Emergency Line Continue

Decisions must be reached regarding a large number of details connected with feeding the 24-in. line of War Emergency Pipelines, Inc., although the main outline of the program has been determined. Sessions of a committee of major company representatives, presided over by Robert H. Colley, president, Atlantic Refining Co., have been adjourned from Chicago, Ill., where they were held last week, and are being continued in New York this week.

In the meantime, War Emergency Pipelines, Inc., is progressing with the construction of feeder lines from the Longview, Tex., terminal to connect with pipe-line systems in the East Texas field. In general, plans under consideration have been as follows: Two feeder systems, one to handle No. 2 heating oil and the other for crude, will be laid to all lines which can make substantial deliveries in East Texas.

According to preliminary plans, lines are to be reversed for moving Gulf Coast heating oil to East Texas. The Sun-Yount Lee line may move fuel oil for Gulf, Magnolia, Pure, Atlantic and other interests. The Shell line may move 10,000 bbl. daily from its Deer Park, Tex., refinery as well as 25,000 bbl. which is to come from Corpus Christi, Tex., through a system, plans for which have not been finally approved. The Pan American line may move fuel oil for Sinclair and Humble interests from the Houston-Baytown area. Fuel deliveries are to be made into the feeder system at a central point in the East Texas field.

The crude-oil feeder system will connect with Atlantic, Magnolia, Texas-Empire, Gulf, Sinclair, Bell General and Humble systems. Pure Oil Co. will ship through the Bell General system. Texas-Empire will deliver for Cities Service and Tide Water Associated interests. It is unlikely that the Texas-Empire line running south from East Texas to the Gulf Coast will be reversed.

Pipe Is Shipped for Second Leg of W.E.P.

WASHINGTON, D. C.—Construction of the second leg of the 24-in. pipe line from Longview, Tex., to the East Coast will begin shortly, it is expected, with the announcement by Office of Petroleum Coordinator that the first shipment of seamless steel pipe from the Lorrain, Ohio, mill of the National Tube Co. to points along the second leg's right-of-way has been made.

The contract for 360 miles of 24-in. was let on October 30, within 48 hours after WPB allocated the necessary steel, and deliveries will be maintained at the same rate achieved throughout construction of the Texas-Illinois leg to permit an average construction of 5.5 miles per day.

The prompt conclusion of this contract permitted the supplier to maintain uninterruped fabrication of the 24-in. pipe at the same mill and with the same facilities. Pipe for the remainder of the 857-mile extension will be ordered at a later date.

The 215,000 tons of steel necessary for the completion of the War Emergency line carry an AA-3 priority rating, sufficiently high, it is believed, to insure continuous delivery of pipe and equipment when construction operations get under way before the end of this month.

As of November 12, OPC reported, about 435 miles of the 531-mile "first leg" was completed and in the ground, despite the fact that the preceding 2 weeks' construction was somewhat hampered by heavy rains the entire length of the line.

In addition to the actual line laying, grading and excavation for foundations at terminals are progressing, reports to OPC say. Four tanks have been graded for at Longview and excavations have been made for machinery and buildings. At Norris City, grading is under way for trackage facilities, as well as for pumping stations and tanks.

Laying of W.E.P. Extension May Start in Ohio-Pennsylvania Area

Shipments of pipe for the War Emergency Pipelines, Inc., extension left the mills last week for destinations in Ohio and Pennsylvania where they are unloaded at railroad stations where the first construction work on the eastern leg may start.

As yet, no right-of-way has been bought. Survey parties in the field will complete their work by the first of the year of locating the route from Norris City, Ill., to the New York-Philadelphia refinery areas.

At the first of this week 439 miles of line had been laid for the 531-mile Longview, Tex.-Norris City, Ill., leg of the project which will probably be completed by the middle of December.

Officers for East Texas Pipe Line Scouts Elected

The East Texas Pipe Line Scouts elected new officers for the coming year, as follows: President, R. W. Pitcher, Tidal Pipe Line Co., Tyler; vice president, S. H. Crews, Sinclair Prairie Pipe Line Co., Tyler; secretary-treasurer, D. E. Shoemaker, Humble Pipe Line Co., Longview; editor in chief; H. L. Cliburn, Magnolia Pipe Line Co., Kilgore; associate editors, M. J. Welch, Texas Pipe Line; R. W. Pitcher, Tidal Pipe Line, and S. N. Jackson, Sun Pipe Line, all of Tyler; and national director, E. R. Neath, Humble Pipe Line, Longview.

Buckeye and Other Northern Group Lines Are to Be Merged

A plan for consolidation of Buckeye Pipe Line Co., Indiana Pipe Line Co., Northern Pipe Line Co. and New York Transit Co. was announced last week by Kuhn, Loeb & Co., investment bankers, who drew up the plan.

Under the plan Buckeye Pipe Line would be recapitalized with 1,352,000 new shares of capital stock and the stockholders of the constituent companies would receive new shares of Buckeye and cash for their present holdings. In essence the plan calls for the following:

Stockholders of Buckeye would receive five new shares for each old share, but no cash; stockholders of Indiana Pipe Line would get two new shares of Buckeye for each five shares of Indiana plus $2.50 in cash for each share of Indiana; stockholders of Northern Pipe Line would receive one and one-tenth new shares of Buckeye plus a special dividend of $3 a share on Northern; and stockholders of New York Transit would get one new share of Buckeye for each share of New York Transit.

Meetings of stockholders of the various com-

panies will be held soon, it was announced, with a view to consummating the consolidation by January 1, 1943.

The four companies own and operate pipe lines constituting a trunk system extending from Griffith, Ind., on the west, to Buffalo on the east. They also serve intermediate consuming areas such as East Chicago, Toledo, Detroit and Cleveland. Their combined operations involve the states of Indiana, Ohio, Pennsylvania and New York.

Bayou Construction Work Progresses

In the construction of the Bayou Pipe Line from the Houston area to Baton Rouge, La., steady progress has been made. More than three-quarters of the section between Port Neches and Baytown, Tex., and more than 40 per cent of the section between Port Neches and Baton Rouge has been laid. Special attention is being given to the construction of three stations which would make it possible to operate at 50 per cent of capacity. This would mean that by operating only with the stations between Baytown and Port Neeches the line could handle 30,000 bbl. daily. When all of the 11 stations are operating the capacity of the line would be 60,000 bbl. daily. Laying of the line for the project will be completed about the first of the year.

Preparations are being made for the construction of feeder lines in accordance with the original plans for the project. These include the laying of 6-in. lines from the Baytown terminal. Feeder lines will connect with the Humble station, the Shell refinery at Deer Park, Tex., and will make connections at Texas City, Tex.

In connection with this program, Shell interests filed application with the United States district engineers office at Houston, Tex., for permission to construct a 6-in. pipe line across three streams in Galveston County, Texas.

Specifications call for crossing Clear Creek 109 ft. upstream from the G.H.&S.A. bridge at Kemah; 100 ft. upstream from the same railway's bridge across Dickinson Bayou near San Leon, and 74 ft. upstream from the bridge crossing Moses Bayou 4 miles northwest of Texas City.

Illinois Pipe Line Surveys For Bible Grove Outlet

Surveys are being made by Illinois Pipe Line Co. for a 20-mile 6-in. crude-oil line from the Bible Grove pool in Sections 4, 5, 8 and 9, Township 5n, Range 7e, Clay County, Illinois, to the company's Montrose pump station.

Corpus Christi-Houston Project Awaits Decision

A program for construction of a pipe line from Corpus Christi to the Houston, Tex., area is waiting for a final decision which will clear the way for authorizing construction to get under way. The committee headed by J. A. Neath has had under consideration two alternative plans. One involved the use of a Magnolia natural-gas line and the other contemplated utilizing a natural-gas line of United Gas Pipe Line. In addition to using a gas line in connection with such a system it would be necessary to lay additional lines. It is expected that oil would be pumped through the natural-gas lines at pressures considerably lower than those customary for crude-oil lines.

The project under consideration as well as the Sinclair Corpus Christi-Damon Mound line now under construction would contribute to the program for feeding the War Emergency Pipelines, Inc., system.

Sohio Seeks Permit for Docks on Ohio River

War Production Board has received an application from Sohio Corp. for permission to build a floating dock for loading river barges on the south bank of the Ohio River at a location 5 miles upstream from Mount Vernon, Ind., and downstream from Uniontown, Ky.

Tank-Car and Tanker Shortages Impede Refiners

Difficulty experienced by refiners in obtaining prompt delivery of tank cars delays moving purchased products from plants in Oklahoma, Kansas, Texas and over the Arkansas-Louisiana areas. Scarcity of tankers is also adding to the problem of refiners.

Lone Star Program Is Under Way

Sharman & Allen, successors to Latex Construction Co., are building for Lone Star Gas Co., 41 miles of 12-in. gas lone from Groesbeck to Buffalo, in Texas. At the latter point the line will connect with Lone Star's 18-in. main line. Two 8-in. laterals are being laid with the 12-in. line. Sharman & Allen also are relocating 2 miles of 6-in. and 12-in. gas line near the Sheffield Steel Corp.'s plant, north of Houston, for Houston Pipe Line Co.

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REFINERY ACTIVITY AND EXPANSION

Sharper Swing to Fuel-Oil Production Recommended Despite Recent Changes

A SUBSTANTIAL reduction in the yield of gasoline was registered in domestic refinery operations during September, according to data disclosed this week in the Bureau of Mines monthly petroleum summary. The national average production of motor fuel declined to 37.9 per cent of crude run to stills, the lowest recovery reported since July when gasoline yields were 37.8 per cent. Further cuts have been recommended by the Petroleum Industry War Council.

Gasoline production in five of the refinery districts, grouped in current reports for secrecy in details, declined in September to 35.8 per cent compared to 38.2 per cent in August. The other substantial decline in gasoline manufacture was credited to Rocky Mountain refineries where September motor-fuel yields stood at 41.3 per cent compared with 46.1 per cent in August. A slight increase of 1.2 per cent, lifting gasoline yields to 41.6 per cent of crude charged was reported in the Appalachian district. Mid-Continent and Middle West refineries continued their motor-fuel yields at approximately the August levels.

In September 1941, domestic refineries recovered 44.6 per cent gasoline from crude run to stills, indicating that the national operating level is currently about 6.7 per cent below normal.

Cracking operations accounted for 21.1 per cent of the gasoline production in September compared to 24.8 per cent a year ago.

Another substantial reduction in gasoline yields in Districts 2 and 3 was recommended last week by the Petroleum Industry War Council. The committee recommended a reduction of 5.4 per cent in the gasoline production within District 2 which, assuming that September's operating level prevailed through October, would bring yields in the Mid-Continent and Middle West down to around 40 per cent of crude charged. A reduction of 2.2 per cent was recommended in District 3, which is grouped in current reports with eastern and a few southwestern centers, lowering average motor-fuel production in the region to 35.5 per cent through remainder of this year and the first quarter of 1943.

PERCENTAGE GASOLINE YIELD FROM CRUDE

	Sept. 1942	Aug. 1942	Sept. 1941
East Coast			37.9
Texas Gulf			43.1
Texas Inland	35.8	38.2	55.8
Louisiana Gulf			35.5
Arkansas-N. Louisiana			40.4
Appalachian	41.6	40.4	47.2
Ind., Ill., Ky.	45.3	45.0	53.9
Okla., Kans., Mo.	45.6	45.7	52.9
Rocky Mountains	41.3	46.1	47.2
California	29.4	29.7	35.9
National average	37.9	39.0	44.6

Sketches of Plant Operators . . .

E. J. SLATER, superintendent of the Champlin Refining Co. at Enid, Okla., since 1925, came up in the refining business the hard way—working his way up from the bottom to the top.

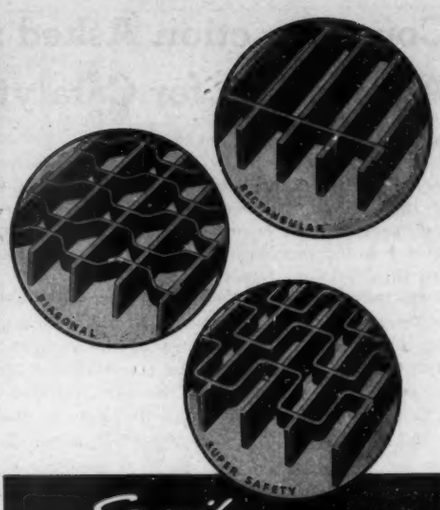
Born in Pennsylvania, Mr. Slater entered the oil industry in 1906 as an employe of the Kendall Refining Co. of Bradford, Pa.

Later he was employed by the Indian Refining Co. at Georgetown, Ky., leaving that position to join the staff of the Magnolia Petroleum Co. at Beaumont, Tex.

Prudential Oil Co. of Baltimore, Md., next claimed his service. He next joined the Indian Refining Co. organization at Lawrenceville, Ill. His next location was with the Pierce Oil Co., in charge of the Sand Springs, Okla., plant (now Sinclair) for some years. He left that post to build and operate a lubricating oil plant at Laredo, Tex., for the Texas-Mexican Oil & Refining Co. From that position he was promoted to his present place as superintendent of the Champlin company at Enid. Mr. Slater has spent much of his time in the study of the manufacture of lubricants.

When a pressure still was erected at the Champlin plant some years ago to make lubricating oils, he incorporated some of his own ideas, which he patented. As a result, a few years ago, that plant removed more carbon from Oklahoma crude than ever had been attained by any plant at that time. Mr. Slater devotes the major portion of his time to his duties, but he finds time in the evening and Sundays to enjoy his small farm and the lifestock he raises there. He has some choice Guernsey cattle and some fine Belgian horses.

His family consists of Mrs. Slater, a married daughter residing in Enid, a son in the U. S. Army, and a daughter who is a senior this year at the University of Oklahoma.



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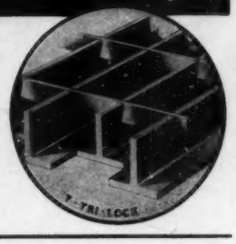

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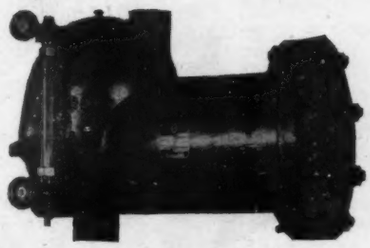

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Court Sanction Asked in Negotiating Agreements for Catalytic Cracking

NEW YORK.—A petition to determine whether it may, under terms of the consent decree issued last March, participate in recommendations of the Office of Petroleum Coordinator approving negotiated agreements for use of various catalytic-refining processes has been filed by Standard Oil Co. (New Jersey).

The company asked the U. S. District Court at Newark, N. J., which issued the consent decree, for an order bearing out plea of the company that the public interest will be best provided for by compliance with the OPC recommendation.

In a second plea to the court, the company has asked that there be postponed until after the termination of the war the question of whether certain issues regarding catalytic-refining processes are subject to the provisions of the consent decree.

In its petition the company said that the consent decree enjoined it from carrying to any conclusion certain previous proposals for the licensing and crosslicensing of its catalytic-refining patents with others in this same field. However, in July of this year, it points out, the OPC recommended that the following companies negotiate such crosslicense and licensing agreements: Standard Oil Development Co., Standard Catalytic Co., Shell Development Co., Texaco Development Co., Standard Oil Co. (Indiana), Universal Oil Products Co., M. W. Kellogg Co., and their respective affiliated companies.

The OPC also recommended that the same companies carry forward their cooperative research and development work on the catalytic-cracking process, the catalytic-reforming process and related catalytic-refining processes. Moreover, it proposed that as such processes became available for commercial use, the design construction and operation of plants for their use be standardized and that there be made available to the petroleum industry generally all preliminary information and data to enable any petroleum refiner to obtain estimates and bids, as well as any needed information to operate and construct licensed plants. Any crosslicensing and license agreements, however, were not to become operative until approved both by the chief counsel of the OPC and certified by the chairman of the War Production Board.

The company has now asked the court to permit it to carry out these agreements, as recommended by the Office of Petroleum Coordinator for War.

In the second request in its petition the Standard Oil Co. (New Jersey) said that in the discussions leading up to the consent decree the catalytic-cracking process, was specifically discussed and both its name and definition were omitted from the consent decree. In fact, the company signed the consent decree on the express understanding that its patents relating to catalytic cracking were not intended to be included in the decree. Subsequently, the company points out, a representative of the attorney general wrote to Standard's counsel and said that "it is our position that all of the catalytic-refining patents are subject to the consent decree." The company's counsel took issue with this new position.

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Petroleum Sulfonates Placed Under Priority Control

WASHINGTON, D. C.—Petroleum sulfonates last week were put under complete allocation and use control by General Preference Order M-188.

Petroleum sulfonates, a byproduct of white-oil production, have recently come into heavy demand for their valuable properties in industrial cutting oils, lubricant additives for high-compression-engine oil, rust preventives, emulsion-type paint, fat splitting, and emulsion breaking. In addition to this, substantial export shipments are necessary.

The order forbids any producer to sell, deliver, use, or refine, and any person to accept delivery of any petroleum sulfonates, except when specifically authorized by WPB. WPB will direct the delivery and use of sulfonates any person may have on hand, as well as the use of material allocated to him. Exception to this restriction is made in the case of 50 lb. or less in a month when the receiver has not received an allocation.

Two Meetings Scheduled Next Month by W.P.R.A.

The Western Petroleum Refiners Association will sponsor two meeting in December.

The first will be in Tulsa, December 4, and will be featured by a talk entitled, "Saving Manpower for War Power," by H. W. Boggess, superintendent of insurance, employment and safety, Sinclair Refining Co., Tulsa.

The second meeting will be in Shreveport, La., December 11, and will feature a discussion of wartime protection of plant facilities and internal safety by Lt. Col. Paul G. Bell and Capt. John M. Mettenheimer, of the Continuous Security Branch, Eighth Service Command, Fort Sam Houston, Tex.

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

A glance at recent California drilling reports gives the impression that the "Thirty Years Ago" section had been displaced. This week, wells are reported in South Belridge, discovered in 1911, Coalinga, East and West, discovered in 1900, Kern River, an 1899 discovery, McKittrick, opened in 1887, and Midway-Sunset in which the first well was drilled in 1901. The reason for this renaissance of these old fields is, of course, the strong demand for heavy crude in California.

The development has much more than a local significance as it implies that relatively shallow fields in all parts of the country may offer the same possibility for drilling with favorable results. In the Kern River field, average daily production per well is about 4 bbl. yet last week's completion gaged 117 bbl. In South Belridge, the old producers are down to about 3 bbl. and the newly drilled wells average 60 bbl.

The decline of production in old fields is commonly attributed to exhaustion of reservoir energy but the flow of oil toward the well may also be impeded by the state of the sand around the well. The bottom of the hole can be cleaned out, some paraffin removal is possible and flow of fluids may be stimulated by shooting but some of the obstructions may be too far from the hole to permit remedial work. Oil flowing through a sand toward a well over a period of years will tend to clog the sand at some distance from the well. Individual grains become dislodged and are pushed into the minute channels in the rock. Emulsion may also clog pores throughout the sand. As a result, redrilling will penetrate an area in which energy may be low but the original permeability of the sand has not been impaired.

This is shown, not only in the case of shallow pays yielding a heavy crude, but also in deep pays with high-gravity oil such as in the Wilcox at Oklahoma City where whipstocking and redrilling is proving successful. In this field, reservoir energy is so depleted that almost the only force flowing oil into the wells is gravity. Yet production is being held at high levels by the redrilling program now under way.

It may be that prior to the abandonment of wells in any field, an attempt to revive them by means of directional drilling will become routine and many millions of barrels will be added to the nation's proven reserves as a result.

OHIO: A large gas well has extended the Brush Creek pool of Morgan County to the south, and a Trenton test in Fulton County has been abandoned after finding only a show of oil (p. 77).

ILLINOIS: The Cypress sand has been found productive in a recently discovered Benoist producing area northwest of Mount Carmel and announcement has been made that a Trenton test in St. Clair County will be deepened to the St. Peter sand (p. 78).

CALIFORNIA: Location has been staked for the first deep test in the Gilmore Island section of Los Angeles and drilling operations in the San Joaquin Valley continue to show substantial increases. The abandonment of a well on the western edge of the Cat Canyon field may mark the end of development in that part of the field for some time (p. 75).

NORTH CENTRAL TEXAS: A new Caddo lime field was opened in Young County and the Mississippian lime was proved productive in the Knox field also in Young County. A Clay County wildcat has encountered oil showings in the Mississippian (p. 76).

LOUISIANA GULF COAST: Preparations are under way to test saturated sands indicated by an electrical survey in a Vermilion Parish wildcat, and a wildcat test in Acadia is reported flowing at a rate in excess of 2,000 bbl. daily (p. 76).

PERMIAN BASIN: Discovery wells of lower Permian production have been completed in Ward and Gaines counties, and a wildcat south of the Wasson field is believed to have encountered sufficient saturation to make a commercial producer. A well ¼ mile south of the Abell field is running structurally high and promises to extend that field (p. 74).

TEXAS GULF COAST: Location has been staked in the Hitchcock area of Galveston County for the deepest test ever drilled into the Frio formation. Three new fields are indicated in Jackson County where two tests showed oil on drill-stem tests and a third cored saturated sand (p. 74).

MICHIGAN: A new field has been opened in Trowbridge Township of Allegan County where a wildcat was completed as a small pumping well. Permits have been issued for several wildcat tests in Saginaw County (p. 79).

SOUTHWEST TEXAS: A second producer is near completion in the Poth field, Wilson County, and two new wildcat locations have been staked in Gonzales County. Wildcats in Atascosa and Jim Hogg counties are continuing to test after producing oil on initial tests (p. 74).

WYOMING: A wildcat on the North Hiawatha structure, Sweetwater County, has opened a new oil field from the Wasatch sand. It is located 2 miles north of a large gas well completed in the same sand last year. The Pilot Butte field has been extended ½ mile south by a large oil well (p. 75).

OKLAHOMA: A discovery well in the Hunton lime has been completed in Seminole County between the Hazel district and the Grayson pool. The Liberty pool of Noble County was extended 1 mile northeast by completion of a large flowing well in the second Wilcox zone (p. 80).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended November 14, 1942)

	Oil	Gas	Dry	Total	Footage	Ttl. comp. to date 1942	Ttl. comp. to date 1941
N. Y., Pa., and W. Va.	53	14	6	73	142,763	3,115	5,235
Ohio	1	9	5	15	30,951	1,020	1,506
Indiana	1	0	1	2	4,431	312	451
Kentucky	0	2	0	2	7,000	228	597
Illinois	31	1	21	53	135,783	1,648	3,221
Michigan	4	2	5	11	22,943	627	802
Kansas	8	3	16	27	89,905	1,389	1,902
Nebraska	0	0	0	0	0	31	75
Missouri, Iowa	0	0	0	0	0	13	33
Oklahoma	7	0	9	16	54,529	1,035	1,652
Texas:							
North Central Texas	5	0	5	10	23,472	982	2,511
West Texas	11	0	6	17	57,547	1,186	1,985
Texas Panhandle	1	2	1	4	12,431	321	596
Eastern Texas	0	1	2	3	17,036	362	929
Texas Gulf Coast	6	1	1	8	45,718	616	959
Southwest Texas	6	1	8	15	82,777	942	1,652
Total Texas	29	5	23	57	239,981	4,409	8,632
North Louisiana	11	0	6	17	81,638	442	682
Louisiana Gulf Coast	4	0	1	5	42,016	427	751
Total Louisiana	15	0	7	22	123,654	869	1,433
Arkansas	5	0	2	7	35,731	163	176
Mississippi and Southeast	0	0	2	2	11,000	69	246
Montana	2	1	0	3	5,579	181	258
Wyoming	1	1	0	2	8,150	98	156
Colorado, Utah	0	0	1	1	925	21	28
New Mexico	3	0	2	5	16,821	234	246
California	16	1	3	20	56,655	684	988
Total United States	176	39	103	318	986,801	16,146	27,637
Total previous week	218	45	111	374			
Week ended Nov. 15, 1941	405	65	140	610			

PERMIAN BASIN, PANHANDLE

Lower Permian Fields Opened In Ward and Gaines Counties

By W. D. THORN

MIDLAND, Tex.—Interest in lower Permian and pre-Permian producing zones in West Texas continued high last week as potential tests were taken on two new lower Permian wildcat producers, a south edge test in the Abell field checked favorably on its Upper Ordovician markers, and two new wildcats were staked on the east side of the basin, in Scurry County.

Shell Oil 2 Sealy-Smith Foundation, opening the Tubb pay zone in the Monahans field, Ward County, was completed flowing 759 bbl. of oil and 26 bbl. of water in 24 hours through open tubing, with gas-oil ratio of 1,369 to 1, after using acid treatment on the lime pay through casing perforations at 5,633-43 ft. It is the second producer in the Monahans pool, being just northwest of Shell's 10,000-ft. Ellenburger discovery. A third operation is scheduled to get under way shortly.

The Texas Co. 1 J. B. Robertson, southern Gaines County wildcat, was completed on the pump for daily potential rating of 299 bbl. daily, based on yield during the last 3 hours of a 6-hour pumping gage. Operators have already built a short pipe line connecting the well with Magnolia's pipe line extending southward from the Seminole field into Andrews County. This new discovery, producing from casing perforations at 5,910-50 ft., probably is producing from near the base of the San Andres lime. It is in the NW SE Section 25, Block A-21, P.S.L. Survey. It was carried to 7,686 ft. before plugging back to complete.

Shell Oil 1 Leaverton, wildcat 4 miles southwest of the Wasson field, was coring below 6,701 ft. in sand and lime. Some observers believe it has encountered sufficient intermittent zones af saturation to make a producer if cased and acidized. Contract depth is 7,500 ft.

Abell May Be Extended

Promising to extend the Abell field, Pecos County, about ¼ mile southward, Humble Oil 1 Parker, Section 6, Block 3, H.&T.C. Survey, topped Simpson at 4,860 ft., Tulip Creek at 5,010 ft., showing favorable structural position, but had to shut down at 5,052 ft. to repair leaky surface pipe before drilling ahead to the McKee sand zone.

Magnolia 1 Alan Robertson, Pecos County wildcat 13 miles northwest of Fort Stockton, was bailing to test squeeze job after drilling out cement to 6,535 ft. It has shown a small amount of oil, along with water, on previous tests. Elsewhere in the same county, Continental 1 Claybrook, Delaware lime wildcat near the Pecos-Reeves County line, was drilling at 3,575 ft. in salt. Pure Oil 1 Odneal, Chancellor field, while still cleaning out after nitro shot in the Delaware pay section, recovered 30 bbl. of oil and 8 bbl. of salt water while swabbing fluid level from 3,300 ft. down to 4,550 ft., and also was showing a little gas. Phillips Petroleum 1 Price, 20 miles southwest of Fort Stockton, was drilling below 6,780 ft. No geological information has been reported on this important wildcat.

In Crane County, Magnolia 1 Tucker, ¼ mile northeast of 1 Glenn, a 6,186-ft. discovery producer between the Abell and the Sand Hills pools, logged base of the Permian at 5,325 ft. and was drilling at 5,442 ft. in lime and chert.

WEST TEXAS COMPLETIONS

Wildcats

Menard County: Phillips Pet. 1 J. M. Treadwell, Sec. 3, Blk. 2, T.W.&N.G. Sur., location abandoned.

Gaines County: The Texas Co. 1 J. B. Robertson, NW SE Sec. 25, Blk. A-21, P.S.L. Sur., elev. 3,312 ft., pumped 299 bbl., gravity 26.3°, gas-oil ratio 350:1, pay through casing perf. 5,910-50 ft., acid 11,000 gal., T.D. 7,686 ft., P.B. 5,952 ft., *discovery*.

Fields

Embar-Tubb, Andrews County: Phillips Pet. 13 University-Andrews, SW SW Sec. 13, Blk. 11, University Sur., elev. 3,290 ft., dry, T.D. 7,170 ft.

World, Crockett County: M. & M. Prod. Co. 1-E L. P. Powell, Sec. 63, Blk. BB, east-edge field, elev. 2,765 ft., dry, T.D. 2,691 ft.

M. & M. Prod. Co. 2-E Powell, Sec. 63, Blk. BB, dry, T.D. 680 ft.

Johnson, Ector County: Amon G. Carter 1-B J. L. Johnson, NE SE SW Sec. 46, Blk. 43, Twp. 1s, T. & P. Sur., elev. 2,992 ft., dry, T.D. 4,411 ft.

McCaulley, Fisher County: F. A. Stephenson et al 2 Mayberry, SW SE Sec. 46, Blk. 1, H.T.&B. Sur., elev., 1,926 ft., dry, T.D. 3,282 ft.

Wasson, Gaines County: Continental Oil 6-43 Langdon, NE SW Sec. 43, Blk. AX, P.S.L. Sur., elev. 3,538 ft. flowed 1,308 bbl., pay 4,955 ft., T.D. 5,004 ft.

Slaughter, Hockley County: Devonian Oil Co. 8 Hudgens, SE NE Sec. 8, Blk. X, P.S.L. Sur., elev. 3,538 ft., flowed 1,385 bbl., pay 4,974 ft., T.D. 5,019 ft.

McCamey, Upton County: Trebol Oil Co. 3 Ricker, Sec.

(Continued on Page 79)

SOUTHWEST TEXAS

Second Producer Near Completion In Poth Field, Wilson County

CORPUS CHRISTI, Tex.—Likelihood of another producer in the Poth field, Wilson County, is seen in Superior Oil 1 G. J. Groos, second well in that field. At 4,314 ft. the bailer was run into the hole and found 900 ft. of high-gravity oil, with apparently no water. Pumping equipment was put in for a production test, but several efforts to pump were hindered by trash collecting in the barrel. In an earlier test only oil rainbows were swabbed and indications pointed to a dry hole.

Two wildcat tests in Gonzales County are announced by W. Stewart Boyle, independent operator of Houston. He has staked 1 J. W. Harris in the W. Page Survey, 660 ft. from the northeast corner of an 80-acre tract. This well, 6 miles south of Waelder, is to be carried 200 ft. into the Midway to a total depth of 5,500 ft. Supporting the test are Shell and H. H. Coffield, of Rockdale. The other test is 1 Ottine Oil Co. in the center of a 40-acre tract in Samuel Robbins Survey, 4 miles south of Darst Creek. The well, which is to penetrate both the Edwards lime and the Austin chalk, is planned for 4,000 ft.

Humble 1 M. L. Thompson, an Atascosa County wildcat 1½ miles southwest of Vickers, was testing at 7,579 ft. at latest report. Previously the well pumped about 200 bbl. of fluid in 24 hours, half oil and the rest brackish sulfur water.

Sun's Jim Hogg County wildcat in the Santa Domingo Arriba grant, 8 miles east of the Colorado field, was continuing its test at 5,303 ft. It got 12.73 bbl. of oil through a 7/64-in. choke, with tubing pressure 1,075 lb., casing pressure 1,125 lb., and gas-oil ratio 69,361:1.

SOUTH TEXAS COMPLETIONS

Wildcats

McMullen County: J. W. Gorman Co. 2 Mrs. E. Atkinson, A.B.&M. Sur. 125, dry at 2,167 ft., sand with faint oil odor at 2,145-50 ft.

Starr County: Sun 1-A Mrs. D. McKinney-State, dry at 6,515 ft.

D. E. DeWitt 1 F. S. de Guerra, Porcion 110, 3 miles southwest of Buena Vista, location abandoned.

Zapata County: Wise & Fallis 1 M. J. Raymond, dry at 2,024 ft.

Fields

Garcia, Starr County: Sun 4-A Garcia Land & Livestock Co., 71 bbl. through 9/64-in. choke, T.P. 460 lb., C.P. 785 lb., T.D. 3,764 ft.

South Campana, McMullen County: Magnolia 2 P G. Kynette, 63 bbl. through 3/64-in. choke, T.P. 775 lb., C.P. 900 lb.

Washburn, La Salle County: Quintana Petroleum Corp. 15 South Texas Synd., 146 bbl. through ¼-in. choke, T.P. 280 lb., C.P. 420 lb., T.D. 5,100½ ft.

LOWER GULF COAST COMPLETIONS

Wildcats

Hidalgo County: Rowan & Hope 1 A. Y. Baker Est., Santa Anita grant, dry at 7,508 ft.

Continental and Sun 1 Mrs. J. J. Young, Santa Anita grant, dry at 10,201 ft.

Fields

Rooke, San Patricio County: Plymouth Oil Co. 2-E E. H. Welder, 52 bbl. distillate through 5/64-in. choke, T.P. 1,700 lb., C.P. 2,200 lb., gas-oil ratio 4,700:1, T.D. 8,551 ft.

St. Charles, Aransas County: Continental 5 St. Charles Co., dry at 9,859 ft.

Seeligson, Jim Wells County: Magnolia 34 Seeligson, 127 bbl. through 7/64-in. choke, T.P. 1,050 lb., C.P. 1,790 lb., gas-oil ratio 715:1, T.D. 6,008 ft.

South Caesar, Bee County: Luling Oil & Gas Co. 3-WB Tom Slick, 138 bbl. through ⅛-in. choke, perf. 6,602-05 ft., T.P. 790 lb., C.P. 1,800 lb., gas-oil ratio 515:1, T.D. 6,605 ft.

SOUTH CENTRAL TEXAS COMPLETIONS

Wildcats

Gonzales County: Continental 2 Catlin, William Newman Sur., S half of county, 4 miles northeast of Wrightsboro, dry at 5,508 ft.

TEXAS GULF COAST

Deep Frio Test to Be Drilled In Galveston County

By T. F. SMILEY

HOUSTON, Tex. — The deepest test into the Frio formation on the Gulf Coast is to be drilled by Glenn H. McCarthy, independent operator of Houston. It is planned to carry the hole to 12,000 ft., which should be some 1,800 ft. penetration of the Frio. The test, according to information obtained from Mr. McCarthy's office, will be in the Hitchcock area of Galveston County. The location is on the Maco Stewart land, in the Spillman league. Hitchcock production up to this time has been from about 5,100 ft., in the Miocene.

Another independent operator of Houston, W. Stewart Boyle, is about to start work on a wildcat location in Jackson County, 1 mile east of the Maurbro field. Supporting the test are Cities Service, Sinclair, Seaboard and Fohs Oil Co. The test will be 1 Henry Banker, in Lot 1 of the I.&G.N. Survey, an area which has ben surveyed geophysically. It is planned to go to 6,000 ft.

In Jackson County, where drilling activity is pronounced, Renwar Oil Corp. 1 O. W. Freeman, in the William Menefee Survey A-53, 2 miles southwest of Ganado, made a 15-minute test at 6,646-51 ft. through ¼-in. chokes at top and bottom, recovering 1,800 ft. of oil and 75 ft. of salt water. The bottom-hole flowing pressure was 2,675 lb.

Texas 2 O. D. Collier, 5 miles west of Edna, in the James Kerr Survey, Abstract 39, cored a broken sand section showing oil at 2,435-55 ft. and was setting 7-in. casing at 2,431 ft.

Harrison & Abercrombie 1 F. R. Betts, in the George Sutherland Survey of Jackson County, recovered oil, water and mud in a drill-stem test at 4,978-86 ft., with working pressure of 300 lb. and bottom-hole pressure of 2,225 lb. Preparations were being made to set casing at 5,020 ft.

TEXAS GULF COAST COMPLETIONS

Alta Loma, Galveston County: Stanolind 7 John A. Harlen, 186 bbl. through ½-in. choke, T.P. 1,100 lb., gas-oil ratio 835:1, T.D. 9,181 ft.

North La Ward, Jackson County. Glenoria Oil Co. 4 Olsovsky-Montex Royalty Co., 77 bbl. through 7/64-in. choke, T.P. 250 lb., C.P. 950 lb., gas-oil ratio 109:1, T.D. 5,683 ft.

Hewitt & Daugherty 2 W. C. Owens, 241 bbl. through ⅞-in. choke, T.P. 675 lb., C.P. 725 lb., gas-oil ratio 200:1, T.D. 5,673 ft.

Orange, Orange County: Kilmanak Oil Co. 1 Federal Royalty Co., 54 bbl. through 3/32-in. choke, T.P. 400 lb., C.P. 800 lb., gas-oil ratio 100:1, T.D. 4,474 ft.

Stewart, Jackson County: Texas 1 F. Groberg, 104 bbl. through 10/64-in. choke, T.P. 150 lb., C.P. 550 lb., gas-oil ratio 275:1, T.D. 5,007 ft.

Stowell, Jefferson County: Glenn H. McCarthy 22 B. R. Prox, dry at 9,890 ft.

West Mauritz, Jackson County: J. B. Coffee et al B-2 T. N. Mauritz, 132 bbl. through 7/16-in. choke, T.P. 720 lb., C.P. 840 lb., gas-oil ratio 560:1, T.D. 5,810 ft.

CALIFORNIA FIELD REPORT

Location Staked for First Deep Test in Gilmore Island Section

By L. P. STOCKMAN

LOS ANGELES, Calif.—Shell Oil Co., Inc., has made location for its first deep test well in the Gilmore Island section of the city of Los Angeles and present plans contemplate immediate drilling. The well which will be carried down in search of Miocene production will be known as Verne Community and will be located 432.83 ft. south and 548.12 ft. west of the center line of First Street and Gardner Street. First Street does not extend through this block and must be produced to the intersection of Gardner Street. This work will end the controversy over the wisdom of permitting drilling operations within the city limits and so close to Wilshire Boulevard's residential and business district unless some one at the last minute steps in and attempts to secure protection by court action. The Gilmore Island area, which was brought into the corporate limits of the city of Los Angeles by action of the city council, presents one of the few areas that geologists feel has a good chance of success. The area is located in what is known as the old Salt Lake field which produced large volumes of crude oil from the Pliocene during its early life.

There is very little exploratory work under way in Los Angeles Basin and one of this group, Shell 1 Garnier at Puente in 33-1s-10w, has been abandoned in lower Puente shale at 4,591 ft. Offsetting this abandonment, Shell has started aggressive development work in the Yorba Linda field of Orange County which the company discovered a few years ago and shut in immediately following a test of the initial well. Work in this field was resumed a few months ago and present plans contemplate the running of two strings of tools for some time to come. The Yorba Linda field produces a heavy grade of crude oil and the productive zone is located around 2,200 ft. which makes the field quite attractive at present. Operators in the Wilmington field would like to drill about 100 new wells to the Ranger and upper Terminal zones but the OPC has not been especially interested in this work as might be desired. The drilling of this group of wells would require about 300,000 ft. of casing and possibly considerable pumping equipment which may be one of the reasons the OPC is not particularly interested. Some exceptions have been granted but the number of permissions granted has only been a drop in the bucket.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: Southwest Development Co. 47 State, 4-6s-11w, pumped 581 bbl., 25.3-gravity, 0.1 per cent cut, T.D. 4,895 ft., perf. 4,327-4,895 ft., completed beneath Huntington Beach tideland by directional drilling.

Puente wildcat district, Orange County: Shell Oil Co., Inc., 1 Garnier, 33-1s-10w, dry in lower Puente shale, T.D. 4,591 ft., minor oil showings 4,225 ft.

Wilmington, Los Angeles County: Long Beach Oil Development Co. 39-W Harbor, 10-5s-13w, pumped 265 bbl., 16.2-gravity, 0.3 per cent, T.D. 3,451 ft., gun perf. 3,208-3,445 ft., completed in Ranger zone of Miocene age.

Drilling Increases in San Joaquin Valley

Drilling operations in San Joaquin Valley proved fields has shown a substantial increase during the past few months especially in those fields that produce a heavy grade of crude at comparatively shallow depths. South Belridge has become very active during this period although these very shallow wells are being finished in about a week from spud to completion. Some are put on jack lines and others are using small, light single equipment. Wells in this field average around 775 ft. and actual time on bottom does not take over 2 days at the most as all drilling is by portable equipment and while one well is being completed another has been spudded in.

The East Coalinga field is also showing increased drilling due principally to operations of Shell Oil Co. Inc., and Standard Oil Co. The former is drilling two wells at present and Standard in addition to work already started has locations staked for 10 additional wells. West Coalinga is also showing increased drilling although on a much more conservative scale. Kern River is another San Joaquin Valley field that is showing increased drilling especially out in the Kern Front area. In the old Kern River field, Tide Water Associated Oil Co. is drilling 18 Green & Whittier and has locations staked for four more wells on the Green & Whittier, Chicago Crude and Reed Crude. This renewal of drilling marks the first time that any number of new wells have been drilled in the older section of the Kern River field. Tide Water Associated Oil Co. has been working in this field for more than a year and appears at last to have solved the water problem to some extent by the use of large water pumps. This reduces the water head by producing a larger amount of fluid and in this field the larger amount of fluid that can be produced means larger production of crude oil. The best wells in the field are those which make large volumes of water as this is a water-drive field under natural conditions. Standard Oil Co. has also been experimenting with larger pumps and by reducing the volume of water has improved conditions generally throughout the section of the field where dewatering operations have been conducted.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co. 56-33-A fee, 33-28s-21e, pumped 60 bbl. 14.7-gravity, 12 per cent cut, T.D. 753 ft., perf. 366-598 ft., 638-78 ft., 716-53 ft., completed in upper Belridge zone of Pleistocene age.

Belridge Oil Co. 28-44 fee, 34-28s-21e, pumped 70 bbl., 15.1-gravity, 40 per cent cut, T.D. 800 ft., perf. 396-604 ft., 626-68 ft., 728-800 ft., completed in upper Belridge zone of Pleistocene age.

Belridge Oil Co. 37-34-A fee, 34-28s-21e, pumped 45 bbl. net, 15.8-gravity, 75 per cent cut, T.D. 759 ft., perf. 393-759 ft., completed in upper Belridge zone of Pleistocene age.

General Petroleum Corp. 33 Belridge, 3-28s-21e, pumped 91 bbl., 13.4-gravity, 10 per cent cut, T.D. 921 ft., perf. 515-747 ft., 769-914 ft., completed in upper Belridge zone of Pleistocene age.

Ohio Oil Co. 6 Emily Hopkins fee, 4-29s-21e, pumped 66 bbl., 15.9-gravity, 11 per cent cut, T.D. 875 ft., perf. 634-855 ft., completed in upper Belridge zone of Pleistocene age.

Ohio Oil Co. 7 Emily Hopkins fee, 4-29s-21e, pumped 54 bbl., 15.4-gravity, 6 per cent cut, T.D. 875 ft., perf. 606-850 ft., completed in upper Belridge zone of Pleistocene age.

Coalinga, East, Fresno County: Standard Oil Co. 105-35-A fee, 35-19s-15e, pumped 27 bbl., 20.9-gravity oil and 32 bbl. water, T.D. 3,170 ft., P.B. 3,080 ft., completed in Coalinga zone of Pliocene age.

Coalinga, West, Fresno County: Standard Oil Co. 100-7-C fee, 7-20s-15e, pumped 22 bbl., 3 per cent cut, 17.3-gravity, T.D. 2,321 ft., P.B. 2,044 ft., perf. 1,994-2,044 ft., completed in upper Coalinga zone of Pliocene age.

Kern River, Kern County: Standard Oil Co. 30-15 fee, 15-28s-27e, pumped 117 bbl., 14.1 gravity oil and 80 bbl. water, T.D. 2,325 ft., perf. 2,198-2,323 ft., completed in Tegeler zone of Pliocene age.

McKittrick, Kern County: Union Oil Co. 78-36 Westport fee, 36-29s-21e, dry at 2,870 ft.

Midway-Sunset, Kern County: Chanslor-Canfield Midway Oil Co. 43-9 fee, 9-32s-23e, pumped 47 bbl., 14.7-gravity, 5 per cent cut, T.D. 1,815 ft., perf. 1,306-1,412 ft., 1,579-1,674 ft., completed in upper zone of Pliocene age.

Richfield Oil Corp. 12 Southwestern, 2-31s-22e, dry at 1,210 ft.

Standard Oil Co. 102-35-B fee, 35-31s-23e, pumped 100 bbl. of 19.4-gravity oil and 86 bbl. water, T.D. 3,205 ft., perf. 2,780-2,950 ft., 3,163-1,203 ft., completed in intermediate zone of Pliocene age.

Tompkins Hill gas field, Humboldt County: Texas Co. 2 Holmes Eureka, 22-3n-1w, flowed 2,730,000 cu. ft. gas, 12/64-in. bean, pressures 1,743-2,020 lb., S.I. pressures 2,370/2,294 lb., T.D. 5,200 ft., perf. 5,090-5,200 ft., completed in gas zone of Cretaceous age.

Development of Cat Canyon Field May Stop

When Standard Oil Co. shut down drilling operations in 5 Los Flores in the Cat Canyon field of Santa Barbara County late last week it possibly marked the end of development work in the extreme western part of the field for the time being. Work was stoppd at a depth of 5,605 ft. when the Los Flores oil sand of Miocene age was found absent. This means that Standard Oil Co. proved up the existence of Miocene production in the West Cat Canyon field but that Union Oil Co. will probably be the only company with exception of Standard that will benefit. Union holds in fee several thousand acres in this region and obviously the development of Miocene production in an area that has heretofore produced

(Continued on Page 76)

ROCKY MOUNTAIN AREA

Wyoming Wildcat Opens New Field From Wasatch Sand

By T. R. INGRAM

DENVER, Colo.—The Vermillion Oil Co. 1 Government, SW NE NE 6-12n-99w, Hiawatha district, Sweetwater County, Wyoming, a wildcat on the North Hiawatha high, pumped 65 bbl. in 24 hours from a sand in the Wasatch at 2,627-45 ft. after plugging back from 3,420 ft. After shutting off bottom water the oil rose 600 ft. in the hole. It is not listed as a completion, however, pending a more thorough test. It is located 2 miles north and a little east of the same company's 1 Horrocks, which was completed in the Wasatch in 1941 for 12,000,000 cu. ft. of gas. The well showed some gas in several horizons below the oil.

Superior Oil Co. 2 Annie Hoffman, CEL NE SW 22-3n-1w, Pilot Butte field, Wyoming, ½ mile south of 1 Suzanne Enos, the nearest producer, topped the Tensleep at 6,230 ft. and is coring in saturated lime at 6,250 ft. The Enos well is not yet a completion, but on a swabbing test made 400 bbl. a day. When rods and tubing were run for a pumping test it flowed 2 bbl. an hour and is now testing on pump. Broderick & Gordon 1 Fidelity Trust, a mile to the south of the Hoffman well, which showed for a gasser in the Muddy sand on a drill-stem test at 3,290 ft., cemented the 8⅝-in. on bottom at 3,850 ft. before continuing on down to the Tensleep.

Continental Oil Co. has shut down operations for the winter in the McCallum district in northern Colorado, where it is drilling 5 Pollock on the north dome and 4-A Hoye on the south dome. The two wells are headed for the sands which produce carbon dioxide gas with high-grade crude oil. The gas comes from the wells at 110° below zero and the company will not take the hazard of completing them in extreme cold weather.

COLORADO COMPLETIONS

Lyons district, Boulder County: Smith & Cordell 1 Chisholm, C SW NW 22-3n-70w, T.D. 925 ft., dry in the Muddy, top of Frontier 265 ft.

WYOMING COMPLETIONS

Big Sand Draw, Fremont County: Sinclair-Wyoming Oil Co. 13 Sand Draw unit, NE SW SE 10-32n-95w, T.D. 4,440 ft., P.B. 4,270 ft., 6,000,000 cu. ft. on drill-stem test, 7-in. 4,437 ft., will perforate opposite Dakota sands, top Lakota 4,045 ft., top Morrison 4,380 ft.

Oregon Basin, Park County: Ohio Oil Co. 6 Lavender-OPC, NW SE SE 30-51n-100w, T.D. 3,710 ft., top Embar 3,310 ft., pumped 270 bbl. from Embar.

MONTANA COMPLETIONS

Bowdoin, Phillips County: Montana-Dakota Utilities 696, NE SW SW 36-32n-33e, T.D. 960 ft., Bowdoin sand 715-760 ft., Phillips sand 880-920 ft., 648,000 cu. ft.

Cut Bank, Glacier County: Glacier Production Co. 2 Bailey, C SW SW 7-33n-5w, T.D. 3,099 ft., 7-in. 3,046 ft., Sunburst show of oil at 3,015-29 ft., dry at 3,045-55 ft., Cut Bank 3,080-97 ft., break at 3,085-90 ft., main pay 3,090-97 ft., swabbed 225 bbl.

Kevin-Sunburst, Toole County: Texas-Pacific 10 Kal-Kevin, SE SW SE 29-35n-2w, T.D. 1,520 ft., contact 1,501-08 ft., acid. 1,000 and 2,000 gal., 10-day average 25 bbl. per day.

NORTHWEST NEW MEXICO

Aztec district, San Juan County: Anna Oil Corp. 5 Government, NW NW 34-30n-11w, dry, 1,750 ft.

NORTH CENTRAL TEXAS

Two Oil Discoveries Reported In North Central Texas

By W. D. THORN

WICHITA FALLS, Tex.—Young County developments held top interest in North Texas last week by contributing two new oil discoveries, one opening a new Caddo lime pool, the other proving Mississippian lime production in an old field.

Mudge Oil Co. of Dallas, Tex., 10 Mrs. W. B. Harrison, located in the northwest corner of Section 3407, T.E.&L. Survey, Knox field, 8 miles northeast of Graham, passed up oil showings from 3,768-3,933 ft. in the field's regular Caddo lime pay zone, then topped Mississippian lime at 4,746 ft., logging saturation from 4,746-65 ft., and at total depth 4,770 ft. after drilling plugs from oil string flowed 60 bbl. oil in 1 hour through casing, flowed by heads while running tubing, then gaged 229 bbl. oil in 6 hours through 12/64-in. choke on tubing, after which it was shut in for potential test. It is the field's first producer in the Mississippian zone. Further exploration for the new pay will be undertaken at once by Mudge Oil Co., with locations staked for Nos. 8 and 11 Harrison.

Standard Oil of Texas and Hanlon-Buchanan 1 G. N. Tolbert, wildcat 9 miles west of Newcastle, in Section 726, T.E.&L. Survey, after plugging back from total depth 5,276 ft. in Ellenburger, perforated casing at 3,857-62 ft. with 30 shots, opposite the Caddo lime, acidized with 3,000 gal., then flowed 90 bbl. of oil and 10 bbl of water in 4 hours through open tubing. This is the fourth consecutive oil strike made by these joint operators in North Texas within the past few months.

Youngblood and Foree 1 Sanzenbacher, Clay County wildcat southwest of Henrietta, topped Bend lime at 5,756 ft., Mississippian lime at 5,995 ft., Simpson at 6,154 ft., topped dolomite, possibly the Ellenburger, at 6,198 ft. and was waiting on orders at total depth of 6,304 ft. It had nominal oil show on a drill-stem test in the Mississippian section. In the Watson field, Clay County, Roy Lee, trustee 2 Conrady was completed flowing 69 bbl. oil in 6 hours through ½-in. choke, from Caddo lime through perforations at 5,398-5,410 ft., after using 3,000 gal. acid.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: Anderson-Prichard Oil Corp. 1 Sealy-Smith Foundation, Sec. 121, Blk. 2, G.H.&H. Sur., pumped 88 bbl. oil plus 39 per cent water per day, pay 3,051-55 ft., T.D. 3,064 ft., P.B. 3,055 ft.

Fields

Wimberly, Jones County: Fain-McGaha Oil Corp. 1-B W. C. Church, Lot 84, Godwin subd., De Witt C.S.L. Sur., flowed 66 bbl. 5 hr. through ¾-in. choke, pay 2,525 ft., T.D. 2,537 ft.

Beddo, Runnels County: Art Tucker et al 1 P. Witter, Lot 53, D. Diaz Sur., 532, pumped 10 bbl. oil and 3 bbl. water, pay 3,503 ft., T.D. 3,539 ft.

Cook, Shackelford County: Roeser-Pendleton and Continental Oil 3-A-112 Cook Est., Sec. 112, E.T.R.R. Sur., dry, T.D. 1,689 ft.

Reddin, Taylor County: Butler and Horne et al 1 W. H. Frazier, Sec. 26, Blk. 17, T.&P. Sur., flowed 212 bbl. plus 10 per cent water in 7 hr. through ¾-in. choke, pay 2,442 ft., T.D. 2,446 ft. lime.

Merkel, Taylor County: Fain-McGaha Oil Corp. 1-B Ruel H. Perry, Subd. 4 of Grimes C.S.L. Sur. 124, pumped 154 bbl. in 19 hr., pay 2,573 ft., T.D. 2,595 ft.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Wilbarger County: W. T. Waggoner Est. 1 fee L-L, Sec. 17, Blk. 5, H.&T.C. Sur., dry, T.D. 1,882 ft.

Young County: West and Stanford 1 Oatman, Sec. 2, G.B.&N. Sur., location abandoned.

Fields

Megargel, Archer County: H. S. Grace et al 1 M. Wear, Lot 8, Crawford subd., pumped 15 bbl. pay 1,273 ft., T.D. 1,282 ft.

Archer, Archer County: Grace & Grace 1 C. E. Carter, Blk. 5, Clark & Plumb Subd., Sec. 38, pumped 12 bbl., pay 807 ft., T.D. 818 ft.

Thornberry, Clay County: C. B. Christie et al 1 Jas. P. Boddy, Sec. 46, Bacon subd., dry, T.D. 1,140 ft.

Avis, Jack County: Hanlon-Buchanan, Inc. 4 E. M. Myers, Sec. 2, S.P.R.R. Sur., A-1592, dry, T.D. 3,450 ft.

Burkburnett, Wichita County: Akin and Dimock 7 E. E. Hardin, O. Farish Sur. A-383, flowed 75 bbl., pay 1,332 ft., T.D. 1,350 ft.

K.M.A., Wichita County: W. H. Hammon 12 fee, Sec. 2, E.T.R.R. Sur., flowed 330 bbl., pay 3,976 ft., T.D. 4,002 ft.

Briar Creek, Young County: Panhandle Refining Co. et al 3 The Allar Co., Sec. 3409, T.E.&L. Sur., dry, T.D. 2,802 ft.

James, Young County: Rankin and Elliott et al 1 D. F. Ford, Sec. 1964, T.E.&L. Sur., pumped 18 bbl. oil and 30 bbl. water, pay 4,093 ft., T.D. 4,104 ft.

Street, Young County: Paul B. Scott 1 L. Eppstein, J. Conner Sur. A-57, dry, T.D. 2,642 ft.

LOUISIANA GULF COAST

Preparations Under Way to Test Vermilion Parish Wildcat

By T. F. SMILEY

NEW ORLEANS, La.—Union Oil Co. of California 1-C Louisiana Furs, Inc., a southern Vermilion Parish wildcat, was preparing to perforate casing at 11,325-30 ft. and test sands previously recorded by an electrical survey. This operation got into trouble when it discovered there was a break in the 5½-in. casing. The difficulty was overcome by going into the hole with a sleeve and cementing over the break.

Union Sulphur 1 J. P. Gueno, a wildcat in Acadia Parish, 51-8s-2e, which had a blowout and fire a few weeks ago, flowed 2,127 bbl. of 51-gravity distillate on a 24-hour gage through two 2-in. chokes on the christmas tree, with 680 lb. pressure at the christmas tree. As the week ended the well was still flowing through four 4-in. flow lines into a battery of separators.

Union Oil Co. of California 9-G Gray estate, 33-10s-12w, Calcasieu Parish, set casing for a test at 5,360 ft. The well is on the flank of the Vinton dome.

Gulf 1-E Haas-Hirsch, 3 miles west of Krotz Springs, St. Landry Parish, was running 7-in. casing at 10,033 ft. The same company's 1-H Amoskeag Savings Bank, in Calcasieu Parish, 18-11s-5w, was coring at 11,426 ft. Gulf was preparing to set casing at 7,730 ft. after a test at 7,690-7,720 ft. showed an oil sand. The well topped the Het at 4,162 ft. and the Vicksburg at 6,672 ft.

LOUISIANA GULF COAST COMPLETIONS

Fields

Baton Rouge, East Baton Rouge Parish: William Helis et al 13 Harry B. Nelson, 36-7s-1w, 152 bbl. through 7/16-in. choke, T.P. 1,800 lb., gas-oil ratio 950:1, T.D. 10,285 ft.

Paradis, St. Charles Parish: Texas 10 D. Lawler et al 39-14s-20e, 185 bbl. through ⅛-in. choke, T.P. 1,625 lb., casing sealed, gas-oil ratio 792:1, T.D. 10,400 ft.

Port Barre, St. Landry Parish: William Helis 4 S. W. Tutral, 20-6s-5e, dry at 8,376 ft.

Strake, Calcasieu Parish: W. T. Burton 8 Industrial Lumber Co. 30-9s-12w, 122 bbl. through 8/64-in. choke, T.P. 500 lb., casing sealed, gas-oil ratio est. 101:1., T.D. 4,605 ft.

Vinton, Calcasieu Parish: Stanolind 3 Octave Ardoin, 37-3s-1w, 190 bbl. through 5/32-in. choke, T.P. 710 lb., C.P. 1,050 lb., gas-oil ratio 713:1, T.D. 8,350 ft.

California Fields

(Continued from Page 75)

exclusively from the Pliocene has greatly increased Union's crude-oil reserves. It was known shortly after this development work was started that there was a probable fault between Standard's Los Flores property and Union's fee-owned acreage because Union found the Los Flores sand of Miocene age substantially higher than it was found by Standard. This zone is highly productive and will probably be found exceptionally prolific at a high point structurally if and when development work is started. When offset wells have been drilled Union will probably suspend drilling and sit tight especially now that deliveries of crude oil from the coastal district are practically impossible due to the hazards of marine transportation. In the Gato Ridge district of Santa Barbara County, Tide Water Associated Oil Co. has run into a heavy tar sand that is producing a very small amount of 6-gravity oil. The hole has been washed with oil and on a pumping test the well is making what oil was put into the hole along with a very small amount of heavy gravity oil. The well in question is 1 Davis in 33-8n-31w, which was bottomed at 6,643 ft. but subsequently plugged back to 5,956 ft.

COASTAL DISTRICT COMPLETIONS

Aliso Canyon, Los Angeles County: Tide Water Associated Oil Co. 1 Fernando, 27-3n-16w, flowed 125 bbl., 20.3-gravity, 2.5 per cent cut, T.D. 5,325 ft., perf. 4,939-5,322 ft., completed in upper Porter zone of Miocene age.

Newhall Potrero, Los Angeles County: Barnsdall Oil Co. 32 Rancho San Francisco, 36-4n-17w, flowed 357 bbl., 33.4-gravity, 3 per cent cut, 240,000 cu. ft. gas, 26/64-in. bean, flow pressures 240 lb., T.D. 7,416 ft., P.B. 7,015 ft., perf. 6,752-6,859 ft., 6,924-7,013 ft., first Modelo zone of Miocene age 6,745 ft., third Modelo zone 7,020 ft., no oil in third Modelo zone, completed in first Modelo zone of Miocene age.

Santa Maria Valley, Santa Barbara County: Union Oil Co. 8 Vincent, 25-10n-34w, flowed 1,471 bbl., 15.1-gravity, T.D. 4,646 ft., perf. 3,067-3,640 ft., 3,919-4,565 ft., completed in Monterey of Miocene age.

EASTERN TEXAS FIELDS

Single Wildcat Location Staked In Eastern Texas Area

By W. D. THORN

DALLAS, Tex.—Only 1 new wildcat location was staked in East Texas last week as the bulk of reports from the field reflected only routine progress.

H. L. Hunt of Dallas announced location for 1 J. H. Sparks, a 6,500-ft. Paluxy sand wildcat in northwestern Rains County, staked 600 ft. from the north line, 340 ft. from the west line of a 53.5-acre tract in the William Rice Survey, a mile southeast of the town of Point. It was moving in rig.

Southwest of Athens in Henderson County, Delta Drilling Co. et al 1 Gentry logged base of massive anhydrite at 7,885 ft., cored hard, tight lime with no shows at 7,900-20 ft., and resumed drilling. It is now checking about 300 ft. lower than British American's lone producer in the Tri-City pool 4 miles to the southwest.

Delta Drilling Co. et al 1 Goldsmith, wildcat in the Quitman area of Wood County, was drilling at 5,830 ft. in the Georgetown lime section which was topped at 5,061 ft. and should reach the Paluxy sand this week. In the same county, at Yantis, Magnolia 1 McCreight was drilling at 2,400 ft.

The Texas Co. 1 Strahan, eastern Nacogdoches County, was drilling below 8,755 ft. in shale and sand with no shows, being 141 ft. in the Travis Peak section at that depth.

Russell Grimes and Harlan Grimes 1 M. B. Ellis in the J. Daly Survey, Grapeland district, Houston County, is reported to be making 150 bbl. daily. The well opens a new Woodbine sand area at 5,932-39 ft. The discovery was erroneously reported last week as an American Liberty-Grimes well.

EAST TEXAS COMPLETIONS

Wildcats

Shelby County: Imperial Pet. Co. 1 Hanson, S. English Sur., dry, T.D. 5,361 ft.

Fields

Waskom, Harrison County: Arkansas Louisiana Gas Co. 1 J. K. Abney unit, Thos. D. Wilson Sur., flowed 17,000,000 cu. ft. gas day, R.P. 2,490 lb., T.D. 6,395 ft.

Long Lake, Leon County: Fleming Oil Co. 2 G. V. Burkett, S. Sanches Sur. 7, top sand 5,270 ft., dry, T.D. 5,280 ft.

OHIO, INDIANA, KENTUCKY

Large Gas Well Extends Brush Creek Pool Southward

ZANESVILLE, Ohio.—Two dry wildcat tests, a number of good gas wells completed and a pool extension indicated an active week in Ohio. One of the largest gas wells reported, Industrial Gas Corp. 2 Vernia Diver, extended the Brush Creek pool of Morgan County ¼ mile south when it flowed 2,900,000 cu. ft. of gas a day from Clinton sand at 4,259-89 ft. On Rattle Snake Creek in Madison Township, Highland County, West & Hunterlock 1 Charles I. Cope was dry at 1,700 ft., 400 ft. below the top of Trenton limestone. In Fulton County, Stevens & Yasdic, of Michigan, abandoned their 1 Floyd Baker, Section 10, Swan Creek Township, at 1,965 ft. after having found only a show of oil. Top of Trenton was 1,864 ft.

OHIO COMPLETIONS

Athens County, Carthage Township: Ohio Fuel 7 Earl Kincade, Jr., 1,660,000 cu. ft., Keener, T.D. 1,249 ft.

C. W. Nuzum 1 J. D. Evans, Fr. 35, 30,000 cu. ft., Maxon (drilled deeper), T.D. 1,050 ft.

Lodi Township: Ohio Fuel 1 L. B. Heck, Sec. 3, 364,000 cu. ft., Macksburg sand 800 ft., T.D. 1,118 ft.

Fulton County, Swan Creek Township: Stevens & Yasdic 1 Floyd Baker, dry, Trenton, T.D. 1,965 ft.

Highland County, Madison Township: West & Hunterlock 1 Charles I. Cope, dry, Trenton, T.D. 1,700 ft.

Holmes County, Richland Township: Ohio Fuel 2 C. R. Adams, Sec. 4, 609,000 cu. ft., Clinton, T.D. 3,420 ft.

Lawrence County, Symmes Township: Ohio Fuel 2 D. A. Moulton, Tr., Sec. 30, 1,880,000 cu. ft., Clinton, T.D. 3,121 ft.

Meigs County, Bedford Township: Ohio Fuel 1 E. L. Hart, Sec. 30, 262,000 cu. ft., stray, T.D. 843 ft.

Salem Township: Downie et al 3 Selmar Ward, Sec. 1, 215,000 cu. ft., Salt sand, T.D. 706 ft.

Morgan County, Homer Township: D. T. Orndoff 2 J. L. Glass, Lot 2, 67,000 cu. ft., Berea 1,366 ft.

York Township: Industrial Gas 2 Vernia Diver, Sec. 26, 2,900,000 cu. ft., Clinton, T.D. 4,289 ft.

Muskingum County, Wayne Township: Ohio Fuel 1 D. H. Liggitt, Sec. 7, dry, Clinton, T.D. 4,172 ft.

Noble County, Enoch Township: C. E. Murry 3 John R. Merry, Sec. 6, dry, Buell Run, T.D. 269 ft.

Noble Township: Thomas Bingam 7 Ernest McKee, Sec. 34, dry, Macksburg sand 300 ft., T.D. 440 ft.

Perry County, Clayton Township: Preston Oil 2 Willis Madden, Sec. 7, 156 bbl., Clinton, T.D. 3,219 ft.

Washington County, Clinton Township: Ohio Fuel 1 Hettie Miller, Sec. 24, 1,150,000 cu. ft., Clinton, T.D. 3,074 ft.

INDIANA

EVANSVILLE, Ind.— In Gibson County, Kirk D. Holland is making a production test at the 1 Collins-Sissons, Don. 97-1n-10w, about 8 miles northeast of Princeton. The only production test available showed 95 bbl. of oil a day from the McClosky lime at 1,798-1,808 ft. after a 1,500-gal. acid treatment.

In the same county, McGinnis and Bitler are making a production test on the 1 Carithers, NW NE SW 26-1s-10w, after setting casing to test the Hardinsburg sand at 1,304-37 ft. A 12-hour production test showed 80 bbl. of oil on swab, and the operators are preparing to shoot the well.

A Warrick County test 3 miles southwest of Sacksville, P. M. Barton et al 1 W. H. Gentry, SW SW NW 11-4s-8w, is shut down for orders.

INDIANA COMPLETIONS

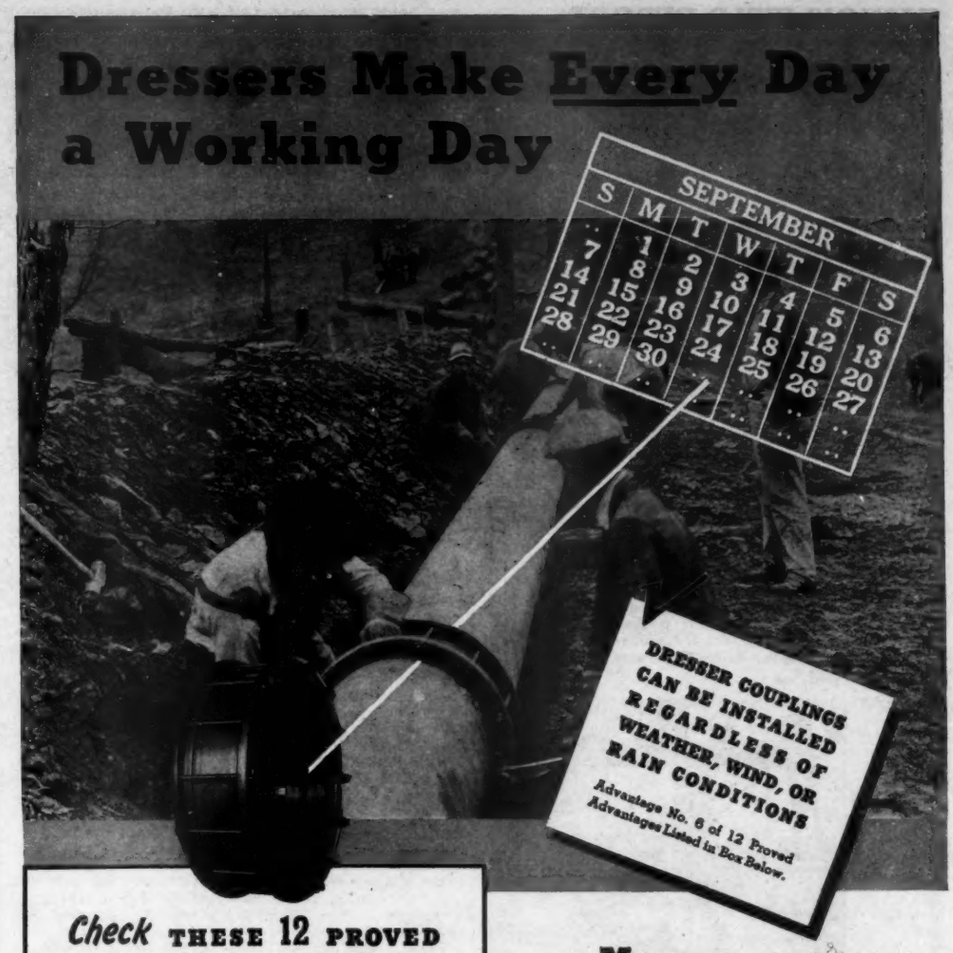
Posey County: Carter and Gulf 6 Erwin, SW SE NW 1-7s-14w, pumped 35 bbl., Waltersburg sand 1,988-93 ft., 2,002-08 ft., T.D. 2,014 ft.

Sullivan County: J. H. Gilliam et al 1 Campbell, SW SW 34-9n-10w, dry, T.D. 2,417 ft., Devonian 2,400 ft.

EASTERN KENTUCKY COMPLETIONS

Knott County: Kentucky-West Virginia Gas Co. 694 Sherwood Osborne land, Right Beaver Creek, flowed 762,000 cu. ft. gas, T.D. 3,625 ft. in shale.

Kentucky-West Virginia Gas Co. 5410 Richard Hall tract, Right Beaver Creek, flowed 189,000 cu. ft. gas, T.D. 3,375 ft. in shale.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ILLINOIS FIELD REPORT

Cypress Sand Found Productive Northwest of Mount Carmel

MATTOON, Ill.—Two developments of interest in the Illinois fields were noted last week. The C. E. Skiles 2 M. Smalley, SE SE NE 3-1s-13w, flowed oil from the Cypress sand on a production test at 2,314-23 ft. The only test gage available was 40 bbl. of oil in 6 hours, flowing through casing with tubing in the hole. When tubing was run in the well, the operators failed to get proper results and the tubing was pulled. The 2 Smalley is the north offset to the discovery well in that area, which is producing from the Benoist sand. The productive area is about 5 miles northwest of Mount Carmel.

Interest in the western side of the Illinois basin was heightened last week with the announcement that the Central Pipe Line Co. had taken over the Paul S. Pritchard 1 J. T. Holliday, SE NE NW 31-2n-7w, and would deepen the well to the St. Peter sandstone. The 1 J. T. Holliday, located on the O'Fallon dome, showed promising Trenton lime saturation on an electrical log but failed to produce even after acidization and was shut down several weeks ago at 2,039 ft. Operators of the Central Pipe Line Co. expect to encounter the St. Peter at about 2,550 ft.

Wildcats

Champaign County: Barker & Sievers 1 Lindsey, NW SE 20-20n-8e, dry at 2,054 ft., Trenton 1,554 ft., St. Peter 2,027 ft.

Clay County: National Refining 1 LaRue, NE SE SW 9-4n-8e, dry at 3,115 ft., McClosky 2,978 ft.

Clinton County: A. B. Schumann 1 Lanx, SE SW SW 5-3n-2w, dry at 890 ft.

Edwards County: Stanolind 1 Braster, SE SE NE 7-2s-10e, pumped 35 bbl., McClosky 3,440-44 ft., T.D. 3,496 ft.

Fayette County: George & Downing 1 Jarrett, NE NE NW 23-4n-1w, dry at 1,453 ft., Benoist 1,414 ft.

Jasper County: Delta Oil 1 Morginn, W½ SW SW 34-6n-10e, dry at 2,905 ft., Fredonia 2,811 ft.

Lawrence County: W. B. Parriott 1 Lake, NW NE 24-4n-11w, 150,000 cu. ft. gas, sand 790-94 ft., T.D. 1,193 ft., *Russellville extension.*

Madison County: Ledbetter et al 1 Haltuman, NE SE 20-4n-7w, dry at 2,320 ft., Trenton 2,207 ft.

Ryan Oil 1 Kisner, NW SW SW 2-4n-6w, dry at 2,619 ft., Devonian 1,769 ft., Trenton 2,517 ft.

C. S. Beck 1 Luf, NE NW SE 5-5n-5w, dry at 2,731 ft., Trenton 2,660 ft.

Marion County: A. L. Williams 1 Feller, NE NW NW 24-4n-4e, dry at 2,715 ft., McClosky 2,711 ft.

Richland County: Nadel et al 1 McEvilly, SW SW 12-3n-14w, dry at 3,099 ft., McClosky 3,022 ft.

Washington County: V. Richardson 1 Weihl, SE SE NW 4-1s-2w, dry at 1,501 ft., Aux Vases 1,413 ft.

Wayne County: V. A. Thompson 1 Griffin, NE SE NE 8-1s-7e, pumped 25 bbl., Aux Vases 3,139-61 ft., T.D. 3,163 ft.

Fields

Benton, Franklin County: E. S. Adkins 5 C. W. & F. Coal, NE NE SE 36-6s-2e, pumped 157 bbl., sand 2,088 ft., T.D. 2,100 ft.

Bible Grove, Clay County: Ohio 1 Poeblu, NW SE NW 4-5n-7e, dry at 2,971 ft., Weller 2,548 ft.

Ohio 3 Poeblu, SE NE NW 4-5n-7e, pumped 100 bbl., Weller 2,500-21 ft., T.D. 2,521 ft.

Pure 2 Kluthe, NW NE SE 4-5n-7e, pumped 101 bbl., Weller 2,493-2,505 ft., T.D. 2,515 ft.

Bluford, Jefferson County: Walter Duncan 1 Crouch, N½ SW SW 36-2s-4e, dry at 3,177 ft., Aux Vases 2,953 ft., Ste. Genevieve 3,018 ft.

Bone Gap, Edwards County: Cities Service 2-A Thread, SE NW NW 18-1s-11e, pumped 66 bbl., McClosky 3,211-22 ft., T.D. 3,228 ft.

Boulder, Clinton County: E. F. Jones 4 Harrison, NW SE NW 2-2n-2w, pumped 140 bbl., natural, Benoist 1,221 ft., T.D. 1,231 ft.

Clay City, Wayne County: Pure 1-E Barth, NE NW 11-1n-7e, pumped 197 bbl., natural, Aux Vases 2,954 ft., T.D. 3,090 ft.

Covington, Wayne County: Sohio 2 Hanna-Sons, NW SW NE 31-1s-7e, dry at 3,293 ft.

Dale, Hamilton County: Pure 1 Union Central, SE SE SE 36-5s-6e, pumped 294 bbl., Aux Vases 3,026 ft., T.D. 3,035 ft., P.B. 2,802 ft.

Shell 2 Morris-Shelton, flowed 230 bbl., Aux Vases 3,027-53 ft., T.D. 3,069 ft.

Shell 3 Summers, SE NW NE 18-6s-7e, flowed 390 bbl., Aux Vases 3,003-17 ft., T.D. 3,052 ft.

Kingwood 2 Shelton, SE SW NE 18-6s-7e, pumped 22 bbl., Aux Vases 3,000 ft., T.D. 3,053 ft.

Kingwood 8 Wilson, SE NE SE 6-6s-7e, pumped 10 bbl., Aux Vases 2,994 ft., T.D. 3,035 ft.

Cameron Bros. 4 Wilson, E½ NW SE 6-6s-7e, swabbed 75 bbl., Aux Vases 3,029 ft., T.D. 3,062 ft.

East Centerville, White County: Magnolia 3 Jones Est., NW SE NE 7-4s-10e, pumped 60 bbl., Vienna 2,469 ft., T.D. 2,500 ft.

W. C. McBride 3 Grey, NE NE SE 7-4s-10e, pumped 7 bbl., sand 2,461-75 ft., T.D. 2,500 ft.

East Inman, Gallatin County: Cherry & Kidd 4 Kerwin, NW NE SW 11-8s-10e, pumped 18 bbl., sand 2,040-50 ft., T.D. 2,073 ft.

Grayville, White County: Skelly 3-B Fearn, NW SE SW 20-3s-14w, pumped 50 bbl., Biehl 1,910-20 ft., T.D. 1,920 ft.

Irvington, Washington County: L. Romine 1 Hoelscher, SW SE NW 10-1s-1w, dry at 1,525 ft., Benoist 1,520 ft.

Louden, Fayette County: Carter 1 Wright, SE NW NE 16-7n-3e, pumped 49 bbl., Cypress sand 1,546-52 ft., T.D. 1,710 ft.

Carter 5-D McCallum, NW SW 2-8n-3e, pumped 70 bbl. oil and 62 bbl. water, Devonian 3,018 ft., T.D. 3,104 ft.

Mount Carmel, Wabash County: Horton & Wiggins 3 Carson, NE SW SE 16-1s-12w, dry at 1,996 ft.

L. C. Kennedy 5 Carson, SW SW SE 16-1s-12w, pumped 28 bbl., Cypress 1,978-94 ft., T.D. 1,997 ft.

Mount Erie, Wayne County: N. V. Duncan 1 Anderson, NW SW 2-1s-8e, flowed 162 bbl. in 2½ hr., Rosiclare 3,068-78 ft., T.D. 3,078 ft.

New Harmony, White County: B. R. Grey 12 Hutch, SE SW NW 21-4s-14w, pumped 36 bbl., Aux Vases 2,826-37 ft., T.D. 2,845 ft.

New Haven, White County: R. B. Martin 1 Todd, E½ NE SE 18-7s-11e, dry at 2,898 ft.

North Aden, Wayne County: Texas 1 Tollacher, SW NE SE 33-2s-7e, dry at 3,231 ft.

North Boos, Jasper County: Pure 1 Swick, NE SW 20-6n-10e, flowed 706 bbl., Rosiclare 2,791-97 ft., T.D. 2,840 ft.

Pure 1 Resch Consol., NE NW 20-6n-10e, flowed 775 bbl., natural, McClosky 2,832-38 ft.

North Sims, Wayne County: Carter 1 Dickey, SW NE 20-1s-6e, dry at 3,215 ft., Aux Vases 3,038 ft.

Roland, White County: Sinclair 1 Lamb, NE SE SW 2-7s-8e, pumped 89 bbl., Cypress 2,628-82 ft., T.D. 2,934 ft.

Carter 9 Hamilton, SE NW SE 2-7s-8e, pumped 36 bbl., Benoist 2,754-71 ft., T.D. 2,943 ft.

Sinclair-Wyoming 1 Parter, SW NW NE 17-7s-9e, pumped 25 bbl., Benoist 2,864-86 ft., T.D. 2,173 ft., P.B. 2,890 ft.

Rural Hill, Hamilton County: Tide Water 1 Lizzy Dennis, SE SE SE 27-6s-5e, dry at 3,426 ft.

St. Paul, Fayette County: Luttrell et al 2 Aukamp, SE SW SE 30-5n-3e, dry at 1,907 ft., Benoist 1,899 ft.

South Lawrence, Lawrence County: Sinclair 9 All States, NW NW SE 22-2n-11w, pumped 80 bbl., Bethel 1,750 ft., T.D. 1,772 ft.

Sam Malis 2 Walker, NW NE SW 26-2n-12w, pumped 106 bbl., Biehl 1,342-69 ft., T.D. 1,369 ft.

South Maunie, White County: Magnolia 12 Higgins, NE SE SE 24-6s-10e, pumped 28 bbl., sand 2,274-2,301 ft., T.D. 2,303 ft.

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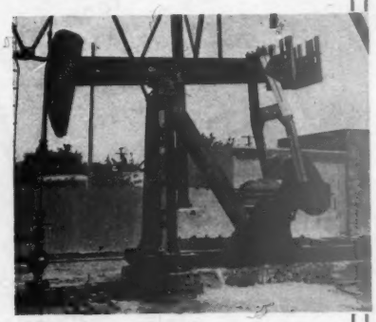

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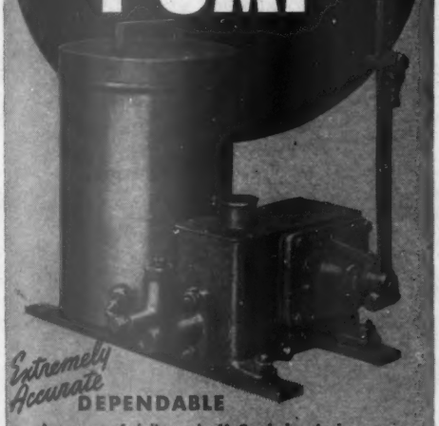

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MICHIGAN OPERATIONS

Small Producer Opens New Field in Allegan County

By OTTO C. PRESSPRICH

SAGINAW, Mich.—A small producer in Trowbridge Township of Allegan County was completed yielding 10 bbl. with salt water after acidization, opening what appears to be another small pool. Best well of the week is 2 Palmer, brought in by T. F. Caldwell, Inc., in Section 21 of Hay Township, Gladwin County. Completed at 3,635 ft., it came in naturally for 300 bbl. a day.

New permits issued include one for Chesaning Township wildcatting in Saginaw County. Del Fortney of Mount Pleasant plans a test on the Yurek lease in Section 2.

Michigan oil and gas production in September was valued at well head at $2,834,258, a $64,000 decline from August. Oil production dropped but natural-gas output showed an increase, the severance-tax division of the state Revenue Department reported. Gas production was 1,321,598,000 cu. ft., a 300,000,000 cu. ft. gain. The tax totaled $56,685 for oil and gas.

Twenty-five counties figured in the production report with Osceola County, containing the principal Reed City field, contributing 841,439 bbl. of oil to the 1,903,870 bbl. state total, plus 347,995,000 cu. ft. of gas.

MICHIGAN COMPLETIONS

Allegan County, Trowbridge Township: H. M. Gibbs, trustee, 1 Ames & Cook, NE NE SE 36-1n-13w, wildcat, pumping 10 bbl. and salt water, T.D. 1,365 ft.

John F. Burton 1 Bargo, NE SE NW Sec. 31, dry, T.D. 1,337 ft.

Arenac County, Standish Township: Arvin Major 1 LaLone, NW NE 5-18n-5e, wildcat, dry, T.D. 3,166 ft.

Bay County, Monitor Township: L. C. MacGregor 7 Staudacher, S½ NE SW 2-14n-4e, pumping 32 bbl., T.D. 2,872 ft.

Calhoun County, Albion Township: Continental Oil Co. 1 Radee, NW SW 14-3s-14w, wildcat, producing 1,180,000 cu. ft. gas, T.D. 1,635 ft.

Clare County, Redding Township: Taggart Brothers Co. 6 Roberts-Brown et al, NE 3-19n-6w, 550,000 cu. ft. gas, P.B. 1,300 ft., from 1,327 ft.

Taggart Brothers Co. 7 State et al, NE Sec. 5, dry, T.D. 1,340 ft.

Gladwin County, Hay Township: T. F. Caldwell, Inc., 2 Palmer, SW NE NW 21-18n-1e, 300 bbl., natural, T.D. 3,635 ft.

(Continued on Page 80)

Permian Basin, Panhandle

(Continued from Page 74)

5, Blk. R, M. S. Denton Sur., elev. 2,618 ft., pumped 194 bbl., pay 2,136 ft., T.D. 2,262 ft.

Spencer, Ward County: Stanolind 6-A Mollie Spencer, C W¼ E¼ Sec. 53, Blk. 34, H.&T.C. Survey., elev. 2,630 ft., flowed 55 bbl. day plus 30 per cent sulfur water through ¼-in. choke, pay 2,914 ft., T.D. 2,927 ft., P.B. 2,925 ft.

Weiner, Winkler County: Ralph Lowe 11 Brown & Altman, SW SW NE Sec. 24, Blk. B-5, P.S.L. Sur., elev. 2,835 ft., flowed 136 bbl. through 1-in. choke, pay 3,073 ft., T.D. 3,180 ft.

PANHANDLE COMPLETIONS

Fields

Gray County: Phillips Pet. 1 Kroner, Sec. 158, Blk. B-2, dry, T.D. 3,316 ft.

Hutchinson County: E. J. Dunigan 5 Luginbyl, Sec. 4, Blk. J, potential 19 bbl., pay 3,148 ft., T.D. 3,190 ft.

Moore County: Canadian River Gas Co. 4-A Thompson, Sec. 25, Blk. 26, flowed 44,500,000 cu. ft. gas, T.D. 2,614 ft.

Phillips Pet. 1 Roy, Sec. 235, Blk. 44, flowed 21,000,000 cu. ft. gas, T.D. 3,311 ft., P.B. 3,236 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcat, Lea County: Davidson & Clower 1 Shell State, NE NE 20-21-34e, dry, T.D. 4,130 ft., salt 1,920 ft., Yates sand 3,814 ft., lime 3,640 ft.

Maljamar, Lea County: Johnny Cockburn 6-B Miller, SW NE 25-17-32e, flowed 840 bbl., open 2-in. at 3,241 ft., pay 4,100 ft., T.D. 4,200 ft., shot.

South Penrose, Lea County: Skelly 4-A King, SW SW 33-22-37e, pumped 35 bbl., pay 3,570 ft., T.D. 3,716 ft., natural.

Salt Lake, Lea County: Continental 3-Brock-7, SW SE 7-20-33e, pumped 99 bbl., pay 2,975 ft., T.D. 3,025 ft., natural.

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KANSAS, NEBRASKA

Second Producer Added to Hazel Arbuckle Pool

By CARL HOOT

KANSAS operations hit a lower tempo last week with 8 oil wells, 3 gassers, and 16 dry holes making up the week's completions. Falcon-Seaboard Drilling Co. 1 Bean, W½ NE SW 25-17-4w, discovery well 1½ miles southwest of the Lindsborg pool of McPherson County, swabbed 30 bbl. of oil an hour on completion tests and was given state potential of 3,000 bbl. Pay is the Viola lime at 3,401-06 ft.

A second producer was added to the new Hazel Arbuckle pool in Stafford County, offsetting the discovery well to the east. Two offsets, to the north and south found the Arbuckle zone low and were dry. The new well was Simpson Oil 1 Sipes, SW SE 21-21-13w, which swabbed 25 bbl. of oil an hour and made initial potential of 1,335 bbl. from Arbuckle at 3,685-93 ft.

A west offset to the one-well Southeast Ray pool of Rooks County was dry at 3,646 ft. Lansing lime was topped at 3,387 ft. and granite wash at 3,634 ft.

KANSAS COMPLETIONS

Wildcats

Barton County: Lario et al 1 Ahlgren, SW NE 2-20-12w, dry, T.D. 3,400 ft., Lansing 3,100 ft., Arbuckle 3,386 ft.

Cowley County, S of Deichman: Summit Drlg. 1 McKnab, NE NW 35-31-4e, dry, T.D. 3,455 ft., Bartlesville 2,943 ft., Mississippi lime 2,998 ft., Arbuckle 3,424 ft.

Margay Oil 1 Thompson, NW NW SE 3-32-3e, dry, T.D. 3,409 ft., Mississippi lime 3,104 ft., Arbuckle 3,400 ft.

Edwards County: Herndon Drlg. 1 Long, NW NE SE 27-26-16w, dry, T.D. 4,918 ft., Lansing 4,000 ft., sand 4,549 ft., Viola 4,644 ft., Simpson 4,671 ft., Arbuckle 4,838 ft., show oil 4,000-05 ft., 4,549-65 ft.

Ellis County: Appleman & Roberts 1 Wade, SE SE NW 12-11-19w, dry, T.D. 3,701 ft., Lansing 3,341 ft., conglomerate 3,590 ft., Simpson 3,645 ft., Arbuckle 3,668 ft.

McPherson County: Falcon-Seaboard 1 Bean, W½ NE SW 25-17-4w, swabbed 30 bbl. an hr., potential 3,000 bbl., Viola 3,401-06 ft., T.D. 3,615 ft.

Saline County: Veeder Supply 1 Carson, SE SW NW 28-16-3w, dry, T.D. 3,570 ft., Mississippi lime 2,922 ft., Viola 3,383 ft., Simpson shale 3,505 ft.

Fields

Cunningham, Pratt County: H. K. Beardmore 5 Kemp, C W½ NW 12-28-11w, pumped 165 bbl., Viola 4,263-72 ft.

Gorham, Russell County: Wakefield and Derby Oil 2 Dillner, E½ SW NE 35-13-15w, dry, T.D. 3,350 ft., Arbuckle 3,318 ft., sand 3,349 ft.

Hazel, Stafford County: Simpson Oil 1 Sipes, SW SE 21-21-13w, swabbed 25 bbl. an hr., potential 1,335 bbl., Arbuckle 3,685-93 ft.

Hugoton, Haskell County: United Producing 2 Roy, approx. C 20-29-34w, 11,515,000 cu. ft. gas, pay 2,680-2,765 ft.

United Producing 1 Roy, approx. C 21-29-34w, 13,408,000 cu. ft. gas, pay 2,530-2,740 ft.

Iuka, Pratt County: Magnolia 3 Beck, SW NE NW 12-27-13w, dry, T.D. 4,408 ft., Viola 4,186 ft., Simpson 4,290 ft.

Laton, Rooks County: Max Cohen et al 5 Doane, S½ SE SW 34-8-16w, pumped 284 bbl., Lansing 3,113-31 ft., T.D. 3,134 ft.

Lindsborg, McPherson County: Auto Ordnance 1-B Sandell, W½ SE SE 5-17-3w, pumped 1,389 bbl., Simpson 3,453-62 ft.

McLouth, Jefferson County: Hatcher-Fisk 2 Harwood, SE NW 28-9-20e, 3,750,000 cu. ft. gas, Bartlesville 1,392-96 ft.

Billingsley et al 2 McLaughlin, SE NW NW 4-10-20e, dry, T.D. 1,607 ft.

Morel, Graham County: Continental and Cities Service 1 Morel, NW NE SE 15-9-21w, pumped 675 bbl., Arbuckle 3,751-55 ft.

Cities Service 1-B Sutor, NW SE SE 22-9-21w, dry, T.D. 3,895 ft., Arbuckle 3,863 ft.

Padgett, Sumner County: Continental 4 Norrish, NW SE SE 27-34-2e, pumped 52 bbl., Mississippi 3,436-84 ft., T.D. 3,490 ft.

Ray, Southeast, Rooks County: Phillips 1 Steele, NE cor. 8-6-20w, dry, T.D. 3,646 ft., Lansing 3,387 ft., granite wash 3,634 ft., no shows.

Silica, Barton County: Comet Drlg. 1 Schartz, NE NE SW 12-20-12w, dry, T.D. 3,412 ft., Arbuckle 3,344 ft.

Roxbury, South, McPherson County: Republic Natural Gas 1 Kinkler, S½ SE SE 30-17-1w, dry, T.D. 2,698 ft., Mississippi chat 2,698 ft.

Westgate-Greenland 1 Gabrielson, S½ SE SW 30-17-1w, dry, T.D. 2,741 ft., chat 2,716 ft.

Cities Service 1-B Robinson, NW NE 31-17-1w, dry, T.D. 2,705 ft., chat 2,667 ft.

Trapp, Russell County: Phillips 4 Kramer, SE NW 14-15-14w, dry, T.D. 3,328 ft., Lansing 3,073 ft.

Coralena Oil 5 Holland, N½ NE SW 16-15-13w, pumped 48 bbl., Lansing 3,074-95 ft., T.D. 3,340 ft.

NORTH LOUISIANA, ARKANSAS

Renewed Activity at New London and Midway Fields

SHREVEPORT, La.—Completions in the North Louisiana-Arkansas area were up last week, compared with the number reported over the past 3 or 4 weeks. In Arkansas there were six completions in four fields and one wildcat test finaled. The Midway field of Lafayette County, which has been comparetively quiet for some time, is apparently headed for renewed activity at its southeastern end. Southwood Oil Co. recently announced locations for its 7, 8, 9, 10, 11, and 12 Hodnett. When drilled, these wells will extend the field ¾ mile east and ½ mile north.

The New London field of Union County was extended slightly to the north with the completion of Marine Oil Co. 4 Frost. The well has been watched with a great deal of interest and latest reports are that it is flowing 10 bbl. an hour. Seven-inch casing was set at 5,897 ft. and total depth was 6,106 ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Caldwell Parish: J. W. Love 1 Louisiana Central Lbr., N½ NE SE 29-13n4e, dry, T.D. 4,570 ft., Sparta 592 ft., Wilcox 1,530 ft., Midway 3,695 ft., chalk 4,398 ft.

East Carroll Parish: Roeser & Pendleton 1 Logan, Sec. 14-23n-13e, dry, T.D. 6,007 ft., Midway 2,440 ft., Travis Peak 3,260 ft., Cotton Valley 4,450 ft.

Claiborne Parish: Houston & Weiner 1 Wilson, NW SE NE 6-23n-5w, dry, T.D. 5,200 ft., Nacatoch 2,056 ft., Saratoga 2,328 ft., Pettit 4,696 ft.

Catahoula Parish: H. L. Hunt 2-A Louisiana Hwd. & Tensas Delta, NW SW 8-4n-5e, dry, T.D. 7,182 ft., Wilcox 4,134 ft., sand 5,406 ft.

La Salle Parish: T. L. James 1 Catahoula Lake, NE NE 29-7n-4e, dry, T.D. 4,290 ft., Cockfield 1,240 ft., Sparta 1,924 ft., Wilcox 2,715 ft.

Fields

Hosston, Caddo Parish: Bayou State Oil Corp. 4-A Brown, SW SW SE 21-22n-15w, pumped 3 bbl., T.D. 1,028 ft.

Haynesville, Claiborne Parish: Midstates 3 Waller, SW SW SW 1-23n-8w, flowed 188 bbl., Pettit 5,350-66 ft., T.D. 5,430 ft.

Midstates 4 Waller, S½ SW NW 2-23n-8w, flowed 337 bbl., Pettit 5,345-60 ft., T.D. 5,425 ft.

Magnolia 1 Willie Mae Lowe, S½ SW SE 4-23n-8w, pumped 146 bbl. in 17 hr., Pettit 5,356-68 ft., 5,398-5,403 ft., T.D. 5,417 ft.

W. B. Hinton 1-A Lowe, approx. NE NW 9-23n-8w, flowed 78 bbl. in 6 hr., Pettit 5,410-20 ft., 5,466-75 ft., perf. 5,409-21 ft.

Midstates 1 Slaton-Standard, NE NW 12-23n-8w, flowed 265 bbl. in 8 hr., Pettit 5,327-42 ft., T.D. 5,410 ft.

Cook & Johnston 1 Knox, SW SE 17-23n-8w, pumped 50 bbl. in 12 hr., Pettit 5,393-96 ft., 5,419-24 ft., 5,442-54 ft., T.D. 5,528 ft.

F. R. Sylvestre 1 Waller, SW NW 23-23n-8w, flowed 33 bbl. an hr., Pettit 5,417-22 ft., 5,430-35 ft., 5,479-85 ft., T.D. 5,505 ft.

Nebo, La Salle Parish: H. L. Hunt F-124 Goodpine, SW SE 5-7n-3e, flowed 275 bbl., perf. 3,836-40 ft., T.D. 4,169 ft.

H. L. Hunt 1 Sandlin, NW NE 8-7n-3e, flowed 105 bbl., perf. 3,384-93 ft., T.D. 4,158 ft.

Harry Shulman 1 Francis-Netherland, Sec. 38-7n-3e, dry, T.D. 4,250 ft., Wilcox 2,470 ft.

Urania, Grant Parish: Placid Oil 3-B Tremont, SE NE 9-9n-1e, pumped 50 bbl., perf. 1,526-38 ft., Wilcox 1,525 ft., T.P. 2,594 ft.

ARKANSAS COMPLETIONS

Wildcat, Bradley County: Placid Oil 1 Southern Lbr. Co., NE SE 11-16s-12w, dry, T.D. 2,045 ft.,

McKamie, Lafayette County: Atlantic Ref. 10 Bodcaw, approx. C SW 32-17s-23w, flowed 22 bbl. distillate an hour through choke, C.P. 2,400 lb., Smackover 9,308 ft., perf. 9,343-53 ft.

Carter Oil 1 McClendon, approx. C NW 36-17s-24w, flowed 134 bbl. distillate through choke, Smackover porosity 9,181 ft., perf. 9,240-80 ft.

Snow Hill, Ouachita County: H. O. Davis et al 1 Cheatham, SW NE 27-15s-15w, dry, T.D. 4,908 ft., Smackover 4,902 ft.

Stephens, Columbia County: G. H. Vaughn, Jr., 2 D. M. Green, NW SE 11-15s-20w, pumped 110 bbl., Tokio sand 2,465-90 ft., perf. 2,469-90 ft.

R. H. Crow 1-B Taylor, SE NE 12-15s-20w, pumped 140 bbl., Smart sand 3,484 ft., perf. 3,103-14 ft.

Troy, Nevada County: Berry Asphalt 1 fee, SW SE NE 5-14s-20w, pumped 25 bbl., Nacatoch 1,163 ft., T.D. 1,171 ft.

MISSISSIPPI COMPLETIONS

Clarke County: C. L. Higgason 1 School Land, SW NE 16-3n-16e, dry, T.D. 5,217 ft.

Lamar County: Placid Oil 4 Batson, SE NW 22-1n-16w, dry, T.D. 5,783 ft.

OKLAHOMA FIELD REPORT

Hunton Lime Field Opened In Seminole County

By CARL HOOT

SEVEN oil wells out of 16 completions, of which 2 were discoveries, made a fairly active week in Oklahoma. In Seminole County, J. E. Hall 1 Stockton, SE NE SE 2-6n-5e, a wildcat between the Hazel district and the Grayson pool, pumped 142 bbl. of oil from Hunton at 4,143-76 ft. Five-inch casing was set at total depth of 4,528 ft. in second Wilcox and a drill-stem test recovered 80 ft. of oily mud with a show of gas. However, after perforating at 4,143-76 ft. and acidizing with 2,000 gal. oil rose 200 ft. in the hole in 12 hours.

Deep Rock's 1 Dailey, SE NW NE 10-22n-2e, a mile northeast extension to the Liberty pool of Noble County flowed 480 bbl. of 45-gravity oil in 6½ hours and was given an initial potential of 1,027 bbl. Pay is the second Wilcox at 4,369-80 ft.

OKLAHOMA COMPLETIONS

Wildcats

Kay County: Deep Rock 1 Fainsworth, NE NE SE 6-27n-5e, dry, T.D. 3,056 ft., Bartlesville 2,962 ft.

Lincoln County: Creekmore-Rooney 1 Southers, NW SE 33-16n-5e, dry, T.D. 4,376 ft., sand 3,631 ft., 3,667 ft., Viola 4,287 ft., Wilcox 4,370 ft.

Logan County: Sunray et al 1 Welch, NW SE 7-16n-2w, flowed 840 bbl., Simpson dolomite 5,600-56 ft., T.D. 5,759 ft., *Guthrie townsite discovery.*

Noble County: Deep Rock 1 Dailey, SE NW NE 10-22n-2e, pumped 1,027 bbl., second Wilcox 4,369-80 ft., *discovery.*

Portable Drlg. 1 Harash, NW NE NE 22-22n-2e, dry, T.D. 4,602 ft., Layton 3,075 ft., 3,245 ft., Viola 4,485 ft., Wilcox 4,540 ft., second Wilcox 4,570 ft.

Pawnee County: Hall-Briscoe 1 Moore, SW SW NE 21-20n-5e, dry, T.D. 3,655 ft., Prue 3,205 ft., Bartlesville 3,435 ft.

Seminole County: J. E. Hall 1 Stockton, SE NE SE 2-6n-5e, pumped 142 bbl., Hunton 4,143-76 ft., T.D. 4,528 ft., *discovery.*

Fields

Cushing, Creek County: J. E. Crosbie 1 Dennison, SW NE 12-18n-7e, dry, T.D. 2,985 ft., Bartlesville 2,900 ft., pumped total of 7 bbl. oil.

Zephyr Drlg. 2-A Sinclair, SE NE NW 34-17n-8e, pumped 50 bbl., Prue 2,396-2,434 ft., T.D. 2,440 ft.

Garr, Pawnee County: Hall-Briscoe 1 Mochbuis, SW NW 33-20n-5e, pumped 72 bbl., Misener 3,668-72 ft.

Hallett, Pawnee County: Johnson Oil & Ref. 1 Turner, NW SE 10-20n-7e, dry, T.D. 2,979 ft., Viola 2,953 ft.

Pauls Valley, Garvin County: Ohio 1-A Huckaby, SE NW SE 25-4n-1w, flowed 430 bbl., Wilcox 4,019-66 ft.

Velma, Stephens County: Skelly 38 Selby, SE cor. 26-1s-5w, pumped 30 bbl., sand 798-854 ft., T.D. 856 ft.

Miscellaneous

Okfuskee County: Bryan & Moffett 2 Dean, NW NE 22-10n-11e, dry, T.D. 2,435 ft., sand 2,401 ft.

Okmulgee County: Stoozier Drlg. 1-A Thompson, NW NW 36-15n-11e, dry, T.D. 2,865 ft., Wilcox 2,838 ft.

Osage County: Clemenshine No. 1, NE SE SW 22-25n-11e, dry, T.D. 1,875 ft., show gas in Bartlesville 1,790 ft.

Michigan Fields

(Continued from Page 79)

Lake County, Cherry Valley Township: Lupher Drilling Co. 1 Manistee State Savings Bank, NE NE SW 10-18n-12w, wildcat, dry, T.D. 3,502 ft.

Ottawa County, Polkton Township: West Michigan Consumers Co. 1 Edward, C NE 13-8n-14w, wildcat, dry, T.D. 1,233 ft.

Zeeland Township: A. S. Hoyt, agent, 1 Stegehuis-Mulder communitized, SE NE SW 30-5n-14w, pumping 6 bbl. and water, acidized; T.D. 1,531 ft.

APPALACHIAN

Salt Water Encountered at Chestnut Ridge Test

PITTSBURGH, Pa. — On Chestnut Ridge in South Union Township, Fayette County, Greensboro Gas Co. topped the Onondaga lime at 7,804 ft. in 2 Barton and the Onondaga chert at 7,808 ft. At 7,868 ft. salt water intruded which rose 6,000 ft. in the hole, the first heavy volume of salt water struck on the Summit. Here, the surface elevation was 2,557 ft., placing the cher at —5,251 ft. and the salt water at —5,331 ft. Miles to the south along this structure and in Springhill Township, Fayette county, a test on the Paul Dunham farm had a show of salt water which was soon exhausted at —5,405 ft. Still farther south on the Greer lease in Morgan Township, Monongalia County, salt water broke in at —5,991 ft.

No. 3 Barton in South Union Township, Fayette County, topped the Onondaga lime at 7,607 ft. and the chert at 7,631 ft. and is drilling at 7,755 ft. with no showing. The surface elevation here is 2,451 ft. placing the chert at —5,180 ft. or 71 ft. higher than No. 2.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Plum Creek Township: Apollo Gas Co. 1 W. C. Fulton, 80,000 cu. ft. gas, Murraysville and Bradford, T.D. 3,335 ft.

Shelocta 1 M. J. Timblin, dry, through Bradford, T.D. 3,721 ft.

Fayette County, German Township: Peoples 1 Andy Sasja, 40,000 cu. ft. gas, stray sand 3,563-66 ft., T.D. 3,815 ft.

South Union Township: Greensboro Gas Co. 2 Barton, dry, Onondaga chert 7,808 ft., salt water 7,868 ft., T.D. 7,868 ft.

Greene County, Cumberland Township: Brummage & Brummage 2 C. and L. Hathaway, drilled deeper, 189,000 cu. ft. gas, Elizabeth sand 2,910 ft., T.D. 2,925 ft.

Monongahela Township: John Conklin et al 1 D. L. Mestrezat, 3,000,000 cu. ft. gas at 1,497 ft., Big Injun 1,479 ft., T.D. 1,497 ft.

Indiana County, Washington Township: T. W. Phillips 1 Gordon Helman, 474,000 cu. ft. gas, Hundred-foot sand 1,332 ft., T.D. 1,405 ft.

WEST VIRGINIA

In Troy district, Gilmer County, Wolfe Pen Oil & Gas Co. (A. M. Cooper et al) is completing 1 Harold E. Bush in Troy district as an oil well and which may open a small local pool. When pay in the Big Injun sand was struck at 1,720 ft., the tools were lost and the well flowed about 50 bbl.

WEST VIRGINIA COMPLETIONS

Braxton County, Salt Lick district: Pittsburgh & West Virginia Gas Co. 7821 W. T. Brown, dry through Injun sand, T.D. 2,093 ft.

Pittsburgh & West Virginia Gas Co. 7893 Bessie E. Mick, dry through Injun sand, T.D. 2,336 ft.

Clay County, Henry district: Clay Gas Co. 8 Adena Corp. 3,653,000 cu. ft. gas, Big lime 1,577 ft., gas in Injun sand, T.D. 1,718 ft.

Virginian Gasoline & Oil Corp. V-1328 Brown, Swan & Goshron, 4 bbl., Injun sand, T.D. 1,839 ft.

Gilmer County: DeKalb district: Car-

(Continued on Page 87)

CANADIAN FIELDS

Location Staked for Test on Sullivan Creek Structure

By VICTOR LAURISTON

CHATHAM, Ont. — The Sullivan Creek structure in the foothills south and west of Turner Valley will be tested by Sullivan Creek Oil Syndicate which has made location in LSD 13, 25-17-5w5. The structure is on the upper reaches of Highwood River north of Trap Creek, and south of the Dyson Creek area, where considerable survey work has been done recently by the Geological Survey of Canada. The general area was previously surveyed by the late Julius Rickert, who located the unfinished Indian Oils 1 in 24-19-6w5, a considerable distance north and west of the new location. Sullivan 1 has derrick up and is preparing to move in cable tools. Test is expected to get the lime around 1,500 ft.

Tests in the Foothills

On the Ram River - Clearwater structure, southwest of Edmonton, Ram River Oils 2, LSD 8, 1-37-11w5,

(Continued on Page 91)

LEGAL

U. S. DEPARTMENT OF AGRICULTURE, Forest Service, Columbus, Ohio. Sealed bids in triplicate will be received until 2:00 PM Eastern War Time December 4, 1942 and then publicly opened, offering bonus for operating rights in connection with gas and oil leases on land located in the State of Ohio, Lawrence County. Separate bids will be received and separate leases issued on each of two descriptions as follows: Block I: N½ NE¼ section 30, T. 5 N., R. 17 W., ORS., containing 85.76 acres, more or less; Block II: SW¼ SE¼ section 17, T. 5 N., R. 17 W., ORS., containing 42.07 acres, more or less. The Secretary's policy on protective leases will be waived on these lands in view of needed increased oil and gas production, permitting drilling at any time by the permittee or as requested by the Secretary of Agriculture to protect the interests of the government. Award of lease will be made only to bidder who can show sufficient experience and financial resources and prove citizenship. Interested parties may obtain bid documents, lease forms, and operating regulations from the Forest Supervisor, U. S. Forest Service, New Post Office Building, Columbus, Ohio.

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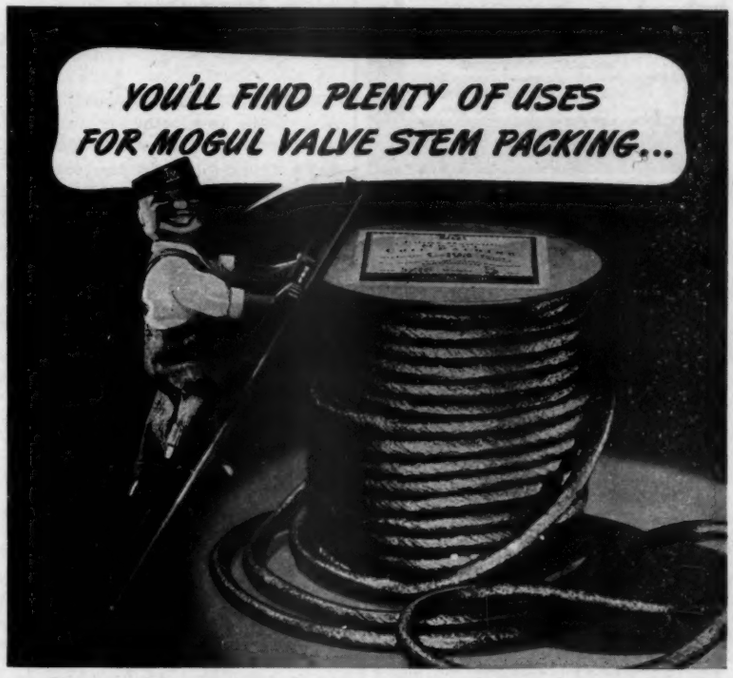

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Among the Drilling

CRON & GRACEY Drilling Corp., Houston, Tex., is near completion of a well in the Gibson field, Terrebonne Parish, Louisiana, for Shell Oil Co., Inc.

PETROLEUM Well Service Co., Houston, Tex., has the contract for two wildcat wells announced by W. Stewart Boyle, independent operator of Houston. Both will be drilled in Gonzales County, Texas. One has been staked in the Nickel area, 6 miles south of Waelder. It is the 1 J. W. Harris. The other, 1 Ottine Oil Co., is in the Samuel Robbins Survey, 4 miles south of Darst Creek. Mr. Boyle is to drill a third wildcat a mile east of the Maurbro field in Jackson County, Texas. The contract had not been let late last week.

SAM E. WILSON, Corpus Christi, Tex., is the contractor for an 8,100-ft. test to be drilled 4 miles east of La Gloria plant in the extreme southern part of Jim Wells County, Texas. This wildcat, in the Raymond de la Garza grant, is a Shell Oil Co., Inc., farmout. The location is 1¼ miles northwest of a test that blew out several years ago.

NOBLE Drilling Co., Ardmore, Okla., has been awarded contract to drill Pure Oil Co. 1 Cox, SW SE SW 16-5n-8e, in the northeastern part of Cimarron County, Oklahoma. The contract is for 8,000 ft.

SUMMIT Drilling Co. and B. B. Blair have made a deal for the 1 Barnes, C NE SW 17-32-2e, near Oxford, Cowley County, Kansas. Operators hold 640 acres of leases.

VIRGINIA Drilling Co. has staked the 1 Estey, SW NE 25-21-11w, in northeastern part of Stafford County, Kansas. The deal was promoted by Mickey Anderson and Isen Brothers. Vickers Petroleum Co. and Phillips Petroleum Co. are supporting the deal.

BIG CHIEF Drilling Co. has been awarded the contract and was moving in tools for a 6,400-ft. test, the Youngblood and Foree 1 Cherryhomes, in Block 3 of G.&B.N. Survey A-2195, about 10 miles east of Jacksboro, in Jack County, North Texas.

CROWE Drilling Co., Hoisington, Kans., is the drilling contractor on the Auto Ordnance Corp., M. & L. Oil Co. and Jay Kornfeld C-1 R. Sandell, C SW SE 5-17s-3w, McPherson County, Kansas, in the Lindsborg (Viola, Simpson) pool, which was drilling at 3,276 ft., using portable rotary rig.

HELMERICH & PAYNE has been awarded contract to drill a 5,000-ft. test to the Ordovician for Hunt Oil Co., of Dallas, Tex. Tentative location for the 1 Turner-McMillen is C SE SE 5-26s-16e, on the Cornudas structure, Otero County, Colorado. The location is on a block of 15,000 acres out of 33,000 acres owned in fee by Fred Turner, Jr., and J. W. McMillen, of Midland, Tex.

C. C. GILGER has been awarded contract to drill F. A. Fuller et al 1 W. J. Boyd, in Sugar Creek field, Claiborne Parish, Louisiana, 18-19n-5w, 1,980 ft. south and 1,980 ft. west of northwest corner of the section. The test will go to the Travis Peak zone.

C. B. JETTER has the contract to drill Wolverine Natural Gas Corp. 1 Alfred E. Spitzley, C S½ SW 21-7n-4w, Clinton County, Michigan.

●

Final Program for Drilling Contractors' Meeting at Tulsa Announced

The final program for the second annual meeting of American Association of Oilwell Drilling Contractors, to be held in Tulsa November 19 and 20, has been announced.

Meetings of the various committees will be held Thursday morning and will be open to everyone. Interesting discussions have been arranged and all drilling contractors are invited to offer any suggestions they may have.

An outstanding ODT speaker from Washington will talk Thursday afternoon on "Rationing and Oil-Field Transportation," and this talk should go a long way toward eliminating much of the confusion occasioned by efforts to meet rationing provisions.

Congressman Wesley E. Disney, of Oklahoma, will be the principal speaker at the Thursday evening banquet. He will talk on national affairs, with emphasis on problems now vital to the oil industry. Elmo Thompson, Superior Oil Corp., will be toastmaster.

The business session Friday morning will be featured by a talk on "Wages and Hours," by Gus C. Street, Jr., regional director, wage-hour division, U. S. Department of Labor, and a paper by Howard P. Holmes, Two States Drilling Co., on "Cooperation Among Drilling Contractors." J. E. Brantly, Drilling & Exploration Co., Inc., president of the association, also will speak at this session.

D. R. Knowlton, director of production, Office of Petroleum Coordinator, Washington, D. C., will address the Friday afternoon session on "The Drilling Contractor Under the Controlled Materials Plan." This talk will give the drilling industry a good idea of what is in store for it during the next year. The Government is now working on a materials-distribution plan which will be adjusted to give necessary equipment to projects approved as necessary to the war effort.

J. S. Montgomery, general superintendent, northern region, Phillips Petroleum Co., will read a paper on "Making the Most of What We Have." This paper will be especially timely, as it will show many ways in which drilling contractors may use whatever equipment they may have to advantage during the emergency.

Major I. O. Hagan, occupational deferment officer for Oklahoma state headquarters of selective service, will address the meeting on "Manpower and Selective Service." Major Hagan will be prepared to answer all questions.

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Contractors

Appalachian Drilling Contractors Discuss Rationing

Gasoline and tire rationing as they apply to the drilling contracting industry comprised most of the discussion of the meeting last week of the Appalachian Drilling Contractors Association at Bradford, Pa. More than 70 drilling contractors attended the meeting, which was addressed by Hugh Grant and Milton Dana, members of the local rationing board. The meeting was presided over by L. R. Oakes, Mount Jewett, Pa., president of the association.

G. G. Bauer, executive secretary of the organization, reviewed the activities of the group since the organization was established early this year. He declared that the association had been active in the fight to retain the depletion allowance, and had opposed the inclusion of the drilling industry in the General Maximum Price Regulation, and had otherwise aided in obtaining favorable legislation for the production branch of the oil industry. He told how the association had assisted recently in filling out numerous applications for certificates of war necessity for trucks of drilling contractors.

The association now has 74 members, with approximately 150 strings of tools represented in the membership.

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JOHN H. WILSON has been awarded contract to drill Rex Oil & Gas Co. 1 Claude Oakes, C NE SE 10-11n-1w, Gratiot County, Michigan.

GORDON Oil Co. has contract to drill Peter J. Bolger 1 Michael Weber, C N½ SE SE 11-25n-12w, Grand Traverse County, Michigan. Gordon will also drill Oil Producers, Inc., 1 Woods, NE SE SE 24-18n-12w, Lake County, Michigan, and Gordon Oil Co. 1 Richards et al, C S½ SE SW 17-18n-10w, Osceola County, Michigan.

W. SPENCER COOK will drill Del Fortney 1 Machilana Yurek, NW SE SE 2-9n-3e, Saginaw County, Michigan.

BROWN & PHILLIPS, Falls City, Neb., was rigging up last week for a Bartlesville test about 4 miles southeast of Tarkio, Atchison County, Missouri. The test, which will be drilled with a portable rotary, is for Cities Service Oil Co., and will be a south offset to 1 Glenn Gray, which was a dry hole, in SW SW SW 29-65n-39w, but which had a showing of oil in the Bartlesville sand. Sand was found at 1,462-85 ft.

DEE BARR, Abilene, Tex., has the contract to drill a 1,500-ft. wildcat to be drilled in South Shackelford County, Texas, at a point 9 miles north of Baird. It will be the Brown-Hancock Oil Co. 1 J. M. Windham, spotted on a 40-acre tract in Section 88-12-T.&P. The well will test 14 sand or lime zones known to exist in the area.

DUNCAN Drilling Co., Big Spring, Tex., has rotary contract for two 4,000-ft. wildcats in southwestern Scurry County, Texas. Col-Tex Refining Co., Anderson-Prichard subsidiary, and Standard Oil Co. of Texas, made locations for the tests, their 1 Maxie Wilson, SW NE Section 174, Block 97, H.&T.C. Survey, 5 miles northeast of the Sharon Ridge field, and 1 M. Stewart, SW SW Section 211, same block and survey, 3 miles northwest of the 1 Wilson. Contractor was moving in rig to the 1 Wilson, which will be drilled first.

•

Drilling Employes May Be Allowed "C" Cards

According to Brad Mills, executive secretary of the American Association of Oilwell Drilling Contractors, the Dallas, Tex., regional OPA has advised that drilling employes undoubtedly will be allowed necessary gasoline for driving to and from the job. "C" cards also will entitle workmen to Grade 1 new tires. The 150 miles of occupational driving allowed under "A" cards will be applied against the extra occupational mileage called for by the "C" card, but the extra allowance will always be enough to assure full transportation facilities. The regional office said it would be unfair to give an employe all necessary gasoline, then still permit him the 150 miles for nonoccupational driving.

Other employes riding with "C" card holder also must contribute their occupational mileage to the pool as they are not entitled to double occupational mileage. Where it is impractical for all members of each drilling crew to travel together more than one crew member is entitled to a "C" card. In extreme cases, two or even one employe may travel alone on a "C" card. The drilling industry has been declared one vital to the war effort and where an employe in regular line of duty must travel more than 600 miles per month he is entitled to a "C" card provided he had attempted to comply properly with the pooling-travel arrangement.

The Dallas office also advised it is attempting to obtain the status of winching and rigging-up operations, where a truck or commercial vehicle is furnishing the power while standing by. Where gasoline is used from a tank not attached to the vehicle, rationing will be handled by the OPA. Where the gasoline for winching, etc., is drawn from a common tank attached to the vehicle, it is possible that recommendations will be left to the ODT. However, the latter condition has not been clarified.

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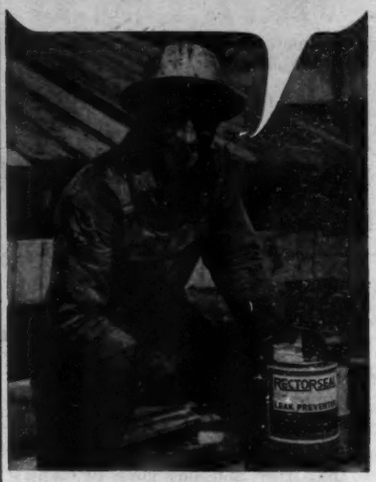

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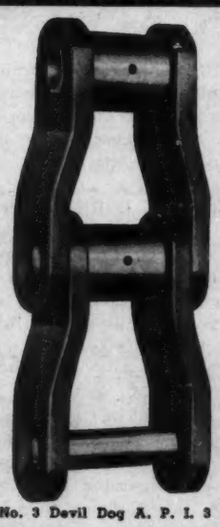

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Personal Paragraphs

JOHN D. McCAMEY, safety engineer for Carter Oil Co., Tulsa, has been appointed a captain in the Army and has gone to Camp Claiborne, at Alexandria, La., for active duty with one of the engineer petroleum distribution detachments. Mr. McCamey, who has been granted a leave of absence from the company, has served Carter as safety engineer since 1935, following his return from Peru, where he was production foreman for International Petroleum Co., Inc.

W. G. ROSS, of Stanolind Oil Purchasing Co., has moved from Great Bend, Kans., to Midland, Tex.

IRA E. PAGE, superintendent of Stanolind Oil & Gas Co., has been appointed a member of Gregg County, Texas, draft board No. 1.

N. A. LINDSAY, traffic manager, Warren Petroleum Corp., Tulsa, was elected president of the Traffic Club of Tulsa at the annual election last week.

W. H. BECKER, JR., formerly on the staff of Jack Frazier, Houston, Tex., oil operator, is now a lieutenant, junior grade, stationed at Overland Park, Kans.

JOHN McGINN, California independent operator, recently returned to Los Angeles, Calif., from Alaska where he operates a mine in addition to his oil activities.

FOREST D. DORN, of Forest Oil Corp., and RALPH T. ZOOK, of Sloan & Zook Co., Bradford, Pa., have been named members of the production subcommittee on the joint use of facilities for District 1, under the OPC.

BRYAN W. PAYNE, Tyler, Tex., president of Iowa-Payne Oil Co. and East Texas Salt Water Disposal Corp., has been named by WPA Administrator Leon Henderson to the national industry advisory committee on petroleum and petroleum products.

HENRY B. SUHR, president of Red Valley Oil Co., Oil City, Pa., has been commissioned a captain in the Army, and has reported at Washington, D. C., for active duty. He will be affiliated with the services of supply of the resources division under LT. COL. JOHN KING, former official of Pennzoil Co.

L. M. PIERCE, cable-tool pusher for Cities Service Oil Co. in the Oklahoma City field, has built himself a wooden tire and mounted it on a wheel frame. He uses it as a spare, but has put it to severe oil-field test and found it performs satisfactorily.

HARRY F. WRIGHT, consulting petroleum engineer and geologist, discussed "Valuation of Oil and Gas Properties and Its Relation to Depletion and Depreciation," at the November meeting of the Petroleum Accountants Society of Oklahoma, Wednesday evening. REDMOND S. COLE, attorney for Gulf Oil Corp., discussed "Pollution and Damage Claims."

J. H. TUTTLE was present at Chester, Pa., when the tanker "J. H. Tuttle," largest ship ever built for Standard Oil Co. of California, was launched. Mrs. Tuttle christened the ship in the traditional manner. Mr. Tuttle has served Standard of California in various capacities for many years and is now vice president and treasurer, and a member of the board of directors.

EDGAR M. PILKINTON, who has been district engineer at Oklahoma City, Okla., for the Mid-Continent area, U. S. Geological Survey, has been transferred to Tulsa, succeeding J. B. MITCHELL, who has gone to Washington, D. C. JOHN A. ANDERSON, petroleum engineer, will be transferred from Washington to Oklahoma City to succeed Mr. Pilkinton. MARSHALL A. STILES, JR., a new man from Washington, is being transferred to Tulsa as assistant petroleum engineer.

Do You Remember?

From The Oil and Gas Journal Files

35 YEARS AGO (1907)

A flowing well, estimated to be making 3,000 to 4,000 bbl. a day, was brought in November 14 by Lake Oil Co. at Anse la Butte, La., 40 miles east of the Jennings field. It is 1,850 ft. deep.

Pres. S. S. Hunter, of Caddo Oil & Gas Co., has announced that his company will double its 6-in. line from the Caddo gas field to Shreveport, La. The new line will serve as a loop to increase the pressure at the terminus.

President Roosevelt at 10:16 a.m., November 16, signed the proclamation declaring Oklahoma a state—the forty-sixth to be admitted to the Union. The ceremonies were given a picturesque turn by participation of Indians.

25 YEARS AGO (1917)

During the first 10 months of the year 1,995 wells were pulled in northwestern Ohio, Indiana, and Illinois oil fields. Much of the material has been shipped to Kentucky fields.

Henry L. Doherty's holding company, Cities Service Co., has just completed purchase from eastern owners of the gas pipe lines, gas wells, and gas leases of American Pipe Line Co. in the central part of the Osage Reservation.

The board of directors of Standard Oil Co. of New Jersey elected A. C. Bedford, hitherto president of the company, chairman of the board, and also elected Walter C. Teagle, formerly vice president and director, as president.

15 YEARS AGO (1927)

The Greater Seminole area still leads the producing parade in Oklahoma, and continues to make its influence felt in many quarters. During the past week the output of this great area has been between 429,000 and 416,000 bbl. daily.

J. Burr Gibbons, general manager of the recent International Petroleum Exposition, has entered the oil business under the firm name of J. Burr Gibbons Co. Mr. Gibbons is a former president of the Tulsa Chamber of Commerce.

M. J. Gragan, vice president of Louisiana Oil Refining Corp., was elected president of the Louisiana-Arkansas division of the Mid-Continent Oil and Gas Association at the annual meeting of the directors.

DR. T. B. WILLIAMS, geologist for the British Columbia provincial government's Commotion Creek test, will return shortly to Calgary, Alta.

RAY P. DIEHL, independent operator of Oklahoma City, Okla., has closed his office and is awaiting call to service. He has been awarded a commission in the Navy.

THEODORE G. FISHER, geologist for Cities Service Oil Co. in West Texas, has been commissioned a lieutenant junior grade in the Navy, and is awaiting call to active duty.

IRVIN W. LLOYD, manager of asphalt sales for Ohio Oil Co., has assumed his new duties in Washington, D. C., as assistant chief, asphalt section, Office of Petroleum Coordinator.

PHILLIPS SALMAN, general auditor for Socony-Vacuum Oil Co., Inc., was elected first vice president of the Institute of Internal Auditors at the institute's annual meeting in New York City, last week.

G. B. WEBSTER, assistant to the federal oil controller at Ottawa, Canada, left recently for the Pacific Coast after completing a study of Alberta oil operations and the possibilities of completing production.

CURTIS F. BRYAN, president of Bryan Petroleum Corp., Tulsa, has been commissioned a major in the Army, and has left for Washington, D. C., where he was to report for active duty. Major Bryan is a veteran of World War 1.

ROSCOE G. SCHOEFFLER, Oil City, Pa., of Southern Group Pipe Lines, has been transferred to the Lancaster office of Southern Pipe Line Co., and has already assumed his new duties. He has served with the company for 30 years and is in the production department.

BEN H. BLAND, formerly scout for Shell Oil Co., Inc., in West Texas, with headquarters in Midland, has enlisted in the Army as a glider pilot, and is now in training at Rochester, Minn.

WILLIAM N. COTTRELL has been awarded a 40-year button by Standard Oil Co. of Louisiana. He came to the company as purchasing agent from Standard Oil Co. of New Jersey in 1921.

CY OAKES, district superintendent at Oklahoma City, Okla., for Sinclair Prairie Oil Co., returned to his desk Monday from a 2-week hunting trip in New Mexico. His bag consisted of a deer.

A. H. TARVER, independent operator of Shreveport, La., was elected president of the Louisiana-Arkansas division of the Mid-Continent Oil and Gas Association, which met recently at Shreveport.

JOE BICKING, who has been with Skelly Oil Co. as scout and land man in Kansas for 10 years, has resigned to become manager of the oil and gas division of Aero Parts Manufacturing Co., Wichita, Kans.

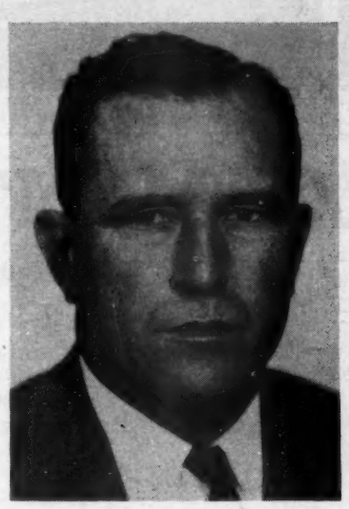
ELBERT W. DILLARD, former independent operator of Fort Worth, Tex., has been appointed an inspector in District 8 offices of the Railroad Commission at Midland, Tex., replacing ELTON SETTLE, resigned.

CAPT. STEWART ROBB, Army Air Corps, son of the late W. B. Robb, pioneer operator in California, returned home this week to recuperate from malaria following service at Bataan, Australia and Port Moresby.

JOHN B. MORRIS, Magnolia Petroleum Co., has been transferred from Tyler, Tex., to become scout with headquarters at Oklahoma City, Okla., replacing WILLIAM E. WARRENSKJOLD, who has joined the Army Air Corps. BRANTLEY JACKSON, of Magnolia's Tyler land office, has been inducted into the Army.

An Inventive Mind

Roy C. Williamson, who recently patented a device to lengthen the life of tubing in pumping wells, is chief engineer for Lion Oil Refining Co., El Dorado, Ark. He has been associated with the oil industry for 15 years.



ROY C. WILLIAMSON

The invention, technically known as rotatable pump tubing hangers, occurred to Mr. Williamson as a result of his extensive experience in production work and his search for a method to prevent the rapid wearing out and constant replacement of steel tubing in pumping wells. Slow rotation and the even distribution of friction on the tubing surface is the secret of his invention, a comparatively simple apparatus which can be manufactured inexpensively.

A native of Arkansas, Mr. Williamson was born in Sebastian County in 1901. After graduating from a Fort Smith high school, he attended college at Baylor University in Texas from which he received his B.A. degree in 1924. He resumed his educational career several years later at University of Oklahoma where, in 1931, he obtained his B.S. degree in petroleum engineering. During the interim between these two degrees, Mr. Williamson was for 2 years occupied with the teaching of academic subjects and the coaching of athletics in Texas schools. In 1926, he went to work for an oil concern in Borger, Tex., and 2 years later joined Pure Oil Co. where he remained from 1928 to 1937 except for the time spent at University of Oklahoma. While with Pure, he gained experience in oil-field construction, rotary drilling, and production.

In 1937, Mr. Williamson joined Lion as production superintendent. He has been chief engineer for the past 2 years. He is married, has a 10-year-old son, Roy, Jr. An outdoor man in his work, he prefers outdoor sports for recreation as well.

B. W. HOGUE, chief chemist of Texas Co., Tulsa, will discuss Oklahoma oil-field brines and their possible utilization, at the Oklahoma Mineral Industries Conference, December 10, at Oklahoma City.

WATSON LAFORCE, Midland, Tex., oil man, flew Railroad Commissioner Beauford Jester from Austin to Odessa, Tex., last week, en route to Midland, where Commissioner Jester was principal speaker at several Armistice Day meetings.

BENTON S. BROOKS, who was formerly in the geological department of Shell Oil Co., Inc., is now in charge of a geological and land office that has been opened in Wichita, Kans., by Champlin Refining Co., of Enid, Okla.

C. R. DOOLEY, manager of the industrial relations department of Socony-Vacuum Oil Co., Inc., until he was loaned to Washington in 1940, is now director of the War Manpower Commission's Training Within Industry section.

W. R. BOYD, president of the American Petroleum Institute, was endorsed for vice president of the United States at a recent meeting of the Citizens Club of Fairfield, Freestone County, Texas. Mr. Boyd was born and reared near Fairfield and he has a farm there.

DR. RICHARD GONZALEZ, economist for Humble Oil & Refining Co., Houston, Tex., will speak at the monthly meeting of the Houston Control of the Controllers Institute of America, on November 24. His topic will be "The Effect to Date of the War on the Country's Economy."

K. C. WALLACE, Los Angeles, Calif., independent operator, had a pleasant surprise this week when he opened up a popular magazine and saw the picture of his son-in-law with another group of officers in the Solomon Islands. The family had no idea where he was and had not yet been in communication with him.

H. F. OSLER has been reelected president of Calgary & Edmonton Corp., Winnipeg, Man. Other officers are C. E. DISHER, vice president, and directors, RT. HON. VISCOUNT CHAPLIN and T. F. C. FROST, of London, England; A. H. DOUGLAS, V. M. DRURY, H. RAY MILNER, L. D. M. BAXTER and ST. W. CAMPBELL.

JOHN D. GILL, of Atlantic Refining Co., introduced the discussion at a round-table conference on "The Oil Problem in Latin America," held this week at Hotel Roosevelt, New York City, by the Latin-American Economic Institute and the Institute of World Economics.

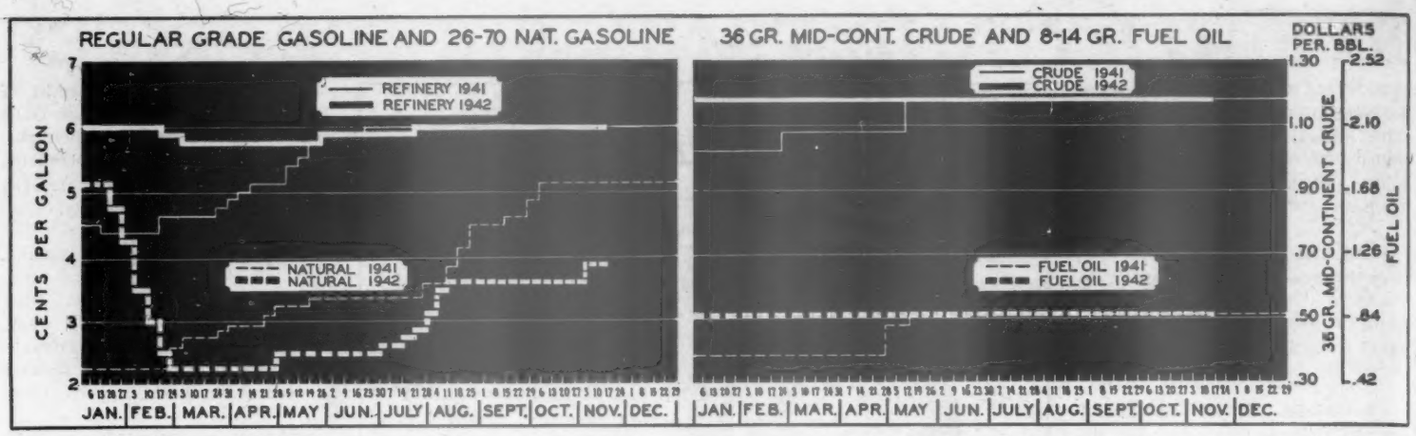
C. S. GOLDSMITH, Brooklyn Union Gas Co., and W. B. POOR, supervising engineer of United Gas Pipe Line Co., Shreveport, La., are two of the industry's representatives who are slated to appear on the program of the annual meeting of the American Society of Mechanical Engineers. Mr. Goldsmith will discuss "Emergency Repair of Gas Mains," and Mr. Poor will describe the Lirette-Mobile pipe line. The meeting will be held in New York City, November 30-December 4.

H. D. COLLIER, president of Standard Oil Co. of California, has been appointed a member of the San Francisco committee of the United Seamen's Service by Adm. Emory S. Land, chairman of the board of trustees. The committee will direct service activities at San Francisco.

A. J. GALLOWAY, executive vice president of Shell Oil Co., Inc., at Houston, Tex., was in Tulsa this week conferring with RALPH B. ROARK, vice president of the Mid-Continent area. Mr. Galloway was accompanied by E. G. ROBINSON, manager, and L. M. CLARK, both of the eastern area at Centralia, Ill.

MICHAEL DEL MONTE, F. M. WOODWARD, H. W. NICKSON, F. M. HIGUERA, and HANS EHLERS, of Union Oil Co., Los Angeles, Calif., who have completed 35 years' service, were given a testimonial dinner recently at which REESE TAYLOR, president of the company, presented each with a gold watch.

GEORGES VORBE, consulting geologist of Midland, Tex., since 1937, has become an associate professor of geology at the New Mexico School of Mines, Socorro, N. M. Mr. Vorbe was one of the first geologists to locate in Midland, going there in 1925 with Roxana Petroleum Co. In 1927 he joined the geological staff of Texas Pacific Coal & Oil Co., then from 1931 to 1934 was professor of geology at University of California at Berkeley, returning to Midland in 1934, when he became a member of Stanolind Oil & Gas Co.'s geological department.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—The need for reducing basic gasoline rations in the East Coast "shortage" area, predicted by some elements of the industry weeks ago, has apparently been recognized by federal agencies and some action is expected to be taken in the near future. It is expected that the value of A cards will be reduced from 4 to 3 gal. per week and that some reduction will also be made in the value of B and X cards. It is possible that the changes will go into effect with the beginning of the third period, November 22.

This need, which has been apparent for some time, was emphasized in October when tank-car shipments into District 1 consistently ran below expectations. These shipments averaged about 120,000 bbl. less than the expected 900,000 bbl. per day with the result that the October total was some 3,775,000 bbl. below anticipations. Preliminary indications for November, based on results for the first week of the month, indicate an even larger deficit is in prospect. Tank-car shipments in that week were 768,719 bbl., 181,281 bbl. under the expected 950,000-bbl. level that the PIWC economics subcommittee used in its recommendation for the month. On this basis, the November shortage would be around 5,450,000 bbl.

An intensive drive against misuse of gasoline ration cards is under way in the Middle Atlantic states and many B and X cards have been revoked as a result of holders using their advantage to attend races and football games. A drive on the so-called "black" market is also believed to be impending. It is unofficially reported that extra stamps, entitling the holder to 4 gal., may be obtained for 10 cents and that holders of unlimited cards are buying gasoline for the use of others.

Mid-Continent

POSTPONEMENT of nation-wide rationing delayed the actual test for motor-fuel market strength in the Mid-Continent until the first of next month but there is increasing evidence that buyers and sellers are discounting the potential reaction. Purchasers inquired this week for motor gasoline for future delivery in approximately the same proportions prevailing before decision was reached to restrict all nonessential driving.

There is agreement in the trade that preferential rations will be much more necessary in the western part of the country than have been extended to eastern drivers because of greater distances between cities.

Natural gasoline continued strong. Suppliers are unable to meet all demand from the Middle West even at the current prices which were advanced 0.25 cent per gallon 10 days ago.

Railroads and industrial plants in the Middle West and Southwest are anxious to purchase larger quantities of residual fuel-oil and their interest is only slightly less intense in light burning material.

War demand, including the entire range of products for transportation and manufacturing operations as well as the armed services, is increasing sharply and is currently pulling ahead of the excesses previously resulting from curtailed civilian consumption.

Refinery prices for motor fuel, burning oils and lubricants are steady at previous levels.

SENTENCE SUMMARIES

EAST COAST: Reduction in basic rationing unit probable. Tighter control of preferred coupons started.

GULF COAST: Natural gasoline tight. Refiners paying higher prices. Shortage partially owing to reduced producing operations.

PACIFIC COAST: Sellers continue control of distillate fuel-oil market with buyers searching for additional supplies.

MID-CONTINENT: Higher prices for natural gasoline fail to discourage buying. All refinery products steady at unchanged levels.

PENNSYLVANIA: Bright stock most active product. Fuel oils continue in short position.

A.P.I. REFINERY REPORT

Week Ended November 7, 1942)

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	155	2,555	433	764
Ind., Ill., Ky.	722	13,628	2,825	6,260
Okla., Kans., Mo.	367	6,197	1,394	2,005
Censored group*	1,631	38,472	18,743	26,598
Rockies	89	1,585	585	423
California	710	16,801	54,337	12,984
Total Nov. 7, 1942	3,674	79,238	78,317	49,034
Total Oct. 31, 1942	3,731	79,159	79,166	48,131
Total Nov. 8, 1941	3,995	82,465	94,861	56,209

Note: Refinery runs and stocks for week ended November 14, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
November 7, 1942	236,198,000
October 31, 1942	239,266,000
November 8, 1941	241,829,000

*Excludes heavy, unrefinable crude in California.

Gulf Coast

HOUSTON, Tex.—Indications of an increasingly tight natural-gasoline market were visible in the Gulf Coast this week. In the Corpus Christi area scarcity of material was reported, and marketers said they expected this condition to spread and eventually to become national. Cutting down of field operations has reduced the supply of natural just at the time when there is growing need for that product. With gasoline extraction from crude cut to 35 per cent from the former average of about 50 per cent, refiners want more natural with which to bring their motor fuel up to required specifications. The demand for high-octane fuel for war purposes adds further to the need for natural.

Gulf Coast refiners already are complaining that they have to pay more for natural gasoline delivered at their plants than they themselves can get for their finished motor fuel. Scarcity of tank cars has increased the problems of the operator who has none and who is in need of natural gasoline.

No sagging in the market for any of the refinery products was reported. Kerosene appeared to be even stronger than last week. Fuel-oil stocks were said to be low among independent refiners, some of them not quoting at all. Skimming plants were having no difficulty in disposing of all the No. 5 fuel oil they could produce.

Pacific Coast

LOS ANGELES, Calif.—The general market is inactive. There appears to be a growing resentment on the part of some marketers over the action of one supplier who is preventing refiners from raising prices up to the maximum pegged price under the ceiling schedules.

Resellers are hoping that the inspection of tires for a fixed fee will enable some of them to stay in business. Reduced driving under the rationing order is expected to increase battery business. Service stations are still closing at a normal rate and there is no evidence of any change in this trend.

Marketers are still buying fuel oil despite the fact that stocks increased over 2,000,000 bbl. during September and a slight accumulation during October. They all feel that conditions during the past 60 days have been subnormal.

A seller market continues for all available diesel and gas oil.

The filling of tanks in Washington and Oregon last summer with heating oil and burner oil has created a temporary slump in demand which normally occurs this time of the year.

Stocks of natural gasoline are tightly held and nothing is moving in the spot market.

REFINERY AND TANK-WAGON PRICES

(Prices as of November 17)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.875-6.000	.....	5.500-5.625	5.125-5.250
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.80	.....	.....	9.2	9.2	.....	.....
Pacific Coast	.....	6.500-7.000	6.250-6.500	6.125-6.250	5.750-6.000	5.125-5.250	4.750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	3.875	4.650	.....
North Texas	3.500	4.200	.....
North Louisiana	3.625	4.350	.....
California	.....	.....	4.875-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	6.800	2.780	1.65
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	$0.80
Gulf Coast	3.875-40	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		37.50
10 pour point		36.50
15 pour point		35.50
25 pour point		30.00
200 vis. at 70° F., 3 color:		
Zero pour point		39.50
10 pour point		38.50
15 pour point		37.50
25 pour point		32.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.050	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-06
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.45	5.50	10.20
Boston, Mass.	14.90	4.50	9.50
Burlington, Vt.	16.90	5.50	...
Buffalo, N. Y.	16.20	5.50	10.30
Dover, Del.	16.70	5.50	11.20
Hartford, Conn.	15.60	4.50	...
Manchester, N. H.	17.30	5.50	10.50
Newark, N. J.	14.70	4.50	9.40
New York, N. Y.	16.10	5.50	9.50
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.60
Providence, R. I.	15.00	4.50	9.30
Washington, D. C.	14.70	3.50	10.70
Average 14 cities (All prices undivided dealer basis.)	15.91	5.07	10.32

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	21.40	7.50	11.40
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.45	7.50	...
Charleston, W. Va.	18.75	7.50	13.00
Charlotte, N. C.	19.60	7.50	11.00
Jacksonville, Fla.	21.40	8.50	10.40
Jackson, Miss.	17.50	7.50	8.50
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	18.60	8.50	10.80
New Orleans, La.	16.75	8.50	*10.00
Norfolk, Va.	16.95	6.50	13.50
Average 11 cities	18.58	7.59	10.58

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	12.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.57	5.96	10.76
Average last week	16.57	5.96	10.76

Appalachian Fields

(Continued from Page 81)

negle 1574 Lee Whiting, drilled deeper, 81,000 cu. ft. gas, Salt sand 1,505 ft., T.D. 1,532 ft.

Troy district: Wolfe Pen Oil & Gas Co. 1 Harold E. Bush, 50 bbl., Injun sand, T.D. 1,720 ft.

Harrison County, Eagle district: Shinnston-Lumberport Gas Co. 1 Thos. Heldreth, gas well, no gage, Gordon, fourth and fifth sands, T.D. 6,900 ft., did not reach Corniferous.

Kanawha County, Big Sandy district: Buff Lick Oil & Gas Co. 1 E. M. Young, drilled deeper, Big lime 1,474 ft., now through Berea, 347,000 cu. ft. gas, T.D. 2,037 ft.

Cabin Creek district: Pure Oil Co. 90 Federal Coal Co., dry through Berea, T.D. 3,204 ft.

Union district: Godfrey L. Cabot 1073 W. H. O'Dell, 1,384,000 cu. ft. gas at 1,577-80 ft., Big lime 1,528 ft., R.P. 400 lb., T.D. 1,598 ft.

Lincoln County, Duval district: Cambridge Gas Co. 1 E. T. Escue, 3 bbl. and 50,000 cu. ft. gas, Big lime 1,725 ft., Injun 1,905 ft., Berea 2,406 ft., T.D. 2,426 ft.

Washington district: Owens, Libby-Owens 1 Lincoln Land 34,000 cu. ft. gas, Berea 2,459 ft., Oriskany 4,826 ft., shot 4,118-4,718 ft., 3,607-3,726 ft., R.P. 398 lb., T.D. 4,840 ft.

Putnam County, Curry district: Reishman Oil & Gas Co. 1 Pike heirs, 133,000 cu. ft. gas, Berea 2,347 ft., shale 3,509 ft., through Oriskany to T.D. 4,478 ft.

Pocatalico district: Godfrey L. Cabot 1 Black Betsy Land Co. 232,000 cu. ft. gas, Big lime 1,526 ft., gas 1,636-62 ft., acidized, R.P. 750 lb., T.D. 1,690 ft.

Roane County, Reedy district: Benedum & Trees 1 H. C. Criner, dry, T.D. 2,700 ft.

Wood County, Clay district: South Penn Nat. Gas Co. 1 Anna McPherson, dry through Berea, T.D. 2,400 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: Mullins Gas Co. 1 J. J. Young, 3,584,000 cu. ft. gas, Corniferous lime 4,909 ft., Oriskany 5,007 ft., T.D. 5,049 ft.

Washington district: Spartan Gas Co. 1 H. H. Carpenter, 5,512,000 cu. ft. gas, Oriskany 5,295-5,300 ft., T.D.

CRUDE-OIL PRICES

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Illinois basin	1.37
Pecos County, Texas	.95
Bradford, Pennsylvania	3.00
Van, Van Zandt County, Texas*	1.08

*No change since 5-21-41.

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Texas*
18-18.9	$0.80	.....	.....	.....
19-19.9	.84	.....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

...unifying pipe line station maintenance

Information supplied by "Oil and Gas Journal"

Pipe line master mechanics have found that pump station efficiency can be improved by the adoption of uniform practices, not only in installing equipment but also in the procedures followed by the machinists.

For example: the reduction of Diesel engine crank bolt breakage achieved by certain companies.

A special jig is used for testing both old and new crank bolts to determine whether elastic limits are in accordance with standard specifications. Specially designed stress gages check the stretch of bolts after installation in the bearing with the nut in place, the gage being then put on the bolt and the nut tightened the allowable stretch prescribed for the machinists to follow.

By this method, assurance is possible that bolts are set with a stretch of 50 to 60 per cent of their elastic limit. Tests made previous to adoption of the uniform procedure indicated that certain bolts had been set up with pressures over 70,000 p.s.i. where only 12,000 to 15,000 p.s.i. was required, while others had not been set up tight enough and breakage occurred due to fatigue.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Avenue • New York City

MOLY

EQUIPMENT PROGRESS...

Lamtex Left-Hand Tool Eliminates String of Tubing

Lamtex Equipment Corp., Fort Worth, Tex., has introduced a new tool, designed to save tubing strings, or permit salvage of those now in service.

Tool is run with a left-hand screw-off mandrel so that in lowering into well casing the operator has a firm and safe hold on the assembly and thus avoids any danger of dropping. The assembly is run in the well casing on sucker-rod string with a slip-joint in order to set packer and seal off the assembly to the well casing. Then, with the weight of rods still slightly on the packer assembly, rods are rotated to the right and the left-hand hand mandrel unscrews, locking itself up positively and completely out of contact with threads on lower part of left-hand mandrel, thus avoiding any possibility of unseating neoprene packer when tool is raised off the packer assembly. Then rods with the upper part of left-hand mandrel are removed from the casing. An insert pump, same as was formerly used with the tubing of either insert or tubing type, is screwed to the rod string in place of the mandrel and run into the casing and seated in conventional manner in a regular seating nipple or tubing pump hold-down. The fluid is conducted to the surface of well through the casing. A permanent standing valve holds fluid in well casing when pump is removed for servicing. This tool provides a means for operator to produce a low volume or low fluid level well without tubing, and still not dump fluid column back on producing formations as is the case where packer is unseated each time pump is pulled for repairs. In high-fluid-level wells this does not affect the producing formation but in low-fluid-level wells the back wash of the fluid is often harmful. Another point of interest is that the left-hand assembly is readily converted into a regular Lamtex casing pump by replacing the left-hand mandrel pump head. This tool is thoroughly field tested.

International Nickel Wins Third Navy Honor

Announcement of the third war-production award to the International Nickel Co. plant at Huntington, W. Va., is made by Robert C. Stanley, president, following receipt of official word from Admiral H. A. Wiley, chairman of the Navy Board for Production Awards.

The latest honor gives the plant the right to fly the Army-Navy "E" with two stars. Previously the works had received the Naval Ordnance Award, later followed by renewal in the form of the All-Navy "E" Award with one star. The plant is among the first 25 throughout the nation, and the first in the Fifth Naval District, to win the two-starred Army-Navy "E" pennant. Each star represents the renewal of production honors for a 6-month period. The original award was for a 12-month period.

TRADE LITERATURE

LEEDS & NORTHRUP CO., 4934 Stenton Ave., Philadelphia, Pa.—Catalog N-33C, on "Micromax Resistance Thermometers for Measurement and Control." This publication shows how information about temperatures and humidity in all parts of a large air-conditioned building plant is brought automatically to one central point, where the operators can keep their fingers on the pulse of the system and thus maintain uniform "manufactured weather." It describes how refinery, chemical, and other process operators are able to see the small but important differences between temperatures at related points in their processes.

PRECISION SCIENTIFIC CO., 1750 North Springfield Avenue, Chicago.—Catalog 700, "Apparatus for Testing Petroleum Products, which consists of 96 pages, comprehensively indexed. The catalog presents detailed information on apparatus for standard methods of testing asphalt, bituminous materials, automotive and aviation fuels and lubricants, conforming to specifications of several societies, institutes and governing bodies.

MARMON-HERRINGTON, INC., Indianapolis, Ind.—A reprint of an article that appeared in the August 8, 1942, issue of Saturday Evening Post, describing what the plant is doing to aid the war effort. The article is entitled "Hell-on-Wheels-Herrington."

ALLIS-CHALMERS, Milwaukee, Wis. — Bulletin B6059-H, a compact compilation of facts of the company's complete centrifugal pump line. Included are pump types for every purpose, single and double suction, single and multistage, mixed and axial flow, etc. Bulletin B6052-C, with simplified charts which permit the reader to determine at a glance all electrical and mechanical characteristics of the motor types designed for the specific application in which he is interested. Numerous typical applications of the companies various motors are illustrated. Bulletin B6051-C, on Texrope V-belt drive. The bulletin reduces a wealth of engineering information to simplified charts and tables for quick selection of these power-transmission parts.

AMONG EQUIPMENT MEN...

Baker Awards Service Pins

The California division of Baker Oil Tools, Inc., presented service pins to its employes in recognition of 5, 10, 15 and 20 years of service, at a banquet held in Los Angeles October 3. T. Sutter, executive vice president and general manager, acted as master of ceremonies.

One hundred and seventy-five employes were in attendance. An even hundred service pins were awarded, including a special platinum and diamond founder's pin presented in turn to R. C. Baker by the employes.

R. C. Baker., Sr., presenting 10-year pin to R. W. Beals

Mr. Baker, president and founder of Baker Oil Tools, Inc., is considered one of the oil-equipment industry's pioneers and inventors. His colorful history covers a span of 50 years, going back to 1893 when he first came to Los Angeles as a contractor-producer. In 1913 he founded the Baker Casing Show Co. at Coalinga, Calif. Shortly thereafter the present corporation was formed, and in 1922 the company moved its headquarters to Los Angeles. Today manufacturing plants and offices are maintained at Los Angeles, Coalinga, and Houston, with branch offices and representatives located throughout the important oil-producing territories of the United States and South America.

Many of the 52 former Baker employes, now in the armed forces, also earned service pins which the company is holding for them until they return.

Honored guests for the evening included Capt. George Serfass and Capt. Joseph W. Campbell of the U. S. Army Ordnance Department. Both officers made interesting and constructive addresses concerning our country's war production and the part that Baker Oil Tools, Inc., is playing in that connection.

A similar banquet and presentation ceremony will be held in the near future as the company's central division headquarters in Houston. Service-pin awards will be made to employes there by C. E. Whitney, vice president and manager of Baker's central division operations.

Murray Named to Head Petroleum Equipment Suppliers Association

F. F. Murray, Oil Well Supply Co., Dallas, Tex., was elected president of the Petroleum Equipment Suppliers Association when members of the association met during the annual meeting of the American Petroleum Institute at Chicago last week. Other officers elected were: F. J. Spang, Spang & Co., Butler, Pa., vice president, and Wharton Weems, Vincent, Elkins, Weems & Francis, Houston, Tex., secretary. Mr. Murray, the new president, served as vice president last year.

Binder Heads Allis-Chalmers Centrifugal Pump Department

Allis-Chalmers, Milwaukee, Wis., announces the appointment of H. P. Binder as manager of the centrifugal-pump department. He had been assistant manager of the hydraulic department in charge of centrifugal-pump sales and engineering since 1940.

The new department head entered the hydraulic department as its first sales engineer in 1919. His career previous to 1919 brought him to Allis-Chalmers from Purdue University in 1911, when he entered the company's student training course. In 1912 he took charge of the company's first hydraulic test pit, handling all development testing for the next several years. He left the engineering department at Allis-Chalmers in 1917 to enter the service. He was captain when discharged at the end of the war.

Inaugurating sales-engineering work in the pump department on his return, he had charge of the sales and engineering on special pump installations, municipal jobs and pump applications in process and power plants for many years. As the department expanded, he trained other men to specialize in these various fields of pump applications.

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little, Rock, Ark.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

20 Years' Experience

Inquiries Invited

B. D. BUCKLEY

60 Broadview Drive, Clayton St. Louis, Mo.

FOR SALE: Oil and Gas Leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Kentucky.

ILLINOIS WILDCATTER
Thoroughly posted as to possibilities for shallow production, in Coles and Edgar counties, acreage for sale, or for test. Sam J. Burkitt, Chrisman, Ill.

FOR SALE: Oil and gas leases North and South Dakota, ten cents acre. Owner, P. O. Box 1163, Tulsa, Oklahoma.

PARTIES to join me 400 acres leases and royalty, Picher, Oklahoma mining field, 4 shafts ready be equipped for zinc production. O. D. Baker, Miami, Okla.

8000 ACRE STRUCTURE full geology, geophysical, cored, equipped rotary & cable. Contractor drafted. Must deal for completion. S. W. Pressey, Pueblo, Colo

SUITABLE acreage, and a good market for oil and gas produced. Splendid post-war proposition. Box 192, Cookeville, Tenn.

THE OIL AND GAS JOURNAL, Oct. 29, page 25, maps R. M. Area. I hold oil leases adjacent U. S. Oil Reservation lands on one great structure. Congress has opened these U. S. lands to lease by American citizens. Want several join filing U. S. lands. Small expense, great opportunity. Box B-363, The Oil and Gas Journal, Tulsa, Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should write to AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press 215 East Third St., Tulsa, Okla.

Help Wanted

NOTICE TO ADVERTISERS

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

ENGINEERS WANTED
Chemical or Mechanical with minimum one year oil refinery plant operation or maintenance experience. Require University Engineering School graduate with basic knowledge principles fluid flow. To work on process flow sheets, equipment selection and general handling oil refinery. Defense Contracts as assistant to senior engineers. No aliens or men engaged Defense work considered. Opportunity up to individual. In reply state experience, education, draft status, salary expected. Foster Wheeler Corporation, Room 2402, 165 Broadway, New York.

Situations Wanted

LABORATORY foreman, 45 years old, draft classification 3B, well versed in treating and mercaptan removal, C. F. R. knock engine operation and maintenance. Experience covers asphalt, lube oils and light oils. Box B-350, The Oil and Gas Journal, Tulsa, Okla.

DESIRE position with Oil Company in Land Department. 25 years' experience in leasing and development work. In good health, not in draft age. Can furnish references as to my ability and character. Box B-365, The Oil and Gas Journal, Tulsa, Okla.

GEOLOGIST with 10 years experience in the Mid-Continent Region desires position with a small company. Please give approximate salary. Box B-360, The Oil and Gas Journal, Tulsa, Okla.

SEVEN years production, pipe line, lease, superintendent, and field representative, middle west fields. Twelve years highway-street construction, specializing asphalts. All positions of supervisory status. Best references. Services available December 1. Address Box B-362, The Oil and Gas Journal, Tulsa, Okla.

CAPABLE man available for field production superintendent. Write Box B-364, The Oil and Gas Journal, Tulsa, Okla.

Legal Blanks

THE BURKHART LINE of Legal Blanks Since 1908. Oil-Gas and Business Forms for Mid-Cont. and Illinois Basin. Leases Rev. with Gov.'s Regulations. Catalog and Samples. Burkhart Ptg. & Sta. Co., 115 So. Cincinnati, Tulsa, Okla.

Equipment Wanted

WANTED TO BUY

Pipe of all sizes, 2" to 16", inclusive, also refineries, pipe lines and abandoned wells. Wire, write or phone

Louisiana Iron & Supply Co.
Shreveport, La.

WANTED: Complete hydraulic casing pulling machine, preferably 400 ton capacity, to handle maximum of 16 inch casing. Box B-361, The Oil and Gas Journal, Tulsa, Okla.

WANTED

Abandoned *Pipe Lines*, in or out of the ground, *Oil Wells, Steel Buildings* and Steel Storage *Tanks* of all sizes.

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards, St. Clair Co., Illinois.

WANTED — Steel tanks total 120,000 gallon capacity. Will take 5000 gallon or larger. Tidewater Equipment & Machinery Corp., 305 Madison Ave., New York, N. Y.

For Sale—Equipment

FOR SALE: 40,000 ft. reconditioned Reda Cable. Specifications #2, 3 conductor, rubber insulated, armor covered, electric transmission cable. Part excellent for use in oil wells, other good for various electric conduction. Leonard Smith, 1526 N.E. 19th St. Ph. 5-0841, Oklahoma City, Okla.

FOR SALE: 1—40 ft. diam. 25 ft. high storage tank and 1—31 ft. diam. and 25 ft. high, 1—25 ft. in diam., 20 ft. high. Ed Walsh, P.O. Box 143, Marion, Indiana.

FOR SALE—Oil Well Pumping Equipment, three 25 HP gas engines, steel derricks, standard rigs. Also 10,000 feet 3 inch line pipe. A. W. Adkisson, W. T. Waggoner Bldg., Fort Worth, Texas.

FOR SALE—One complete steam rotary outfit less boilers, located near Coyle, Oklahoma, priced to sell. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE — 135 ft. ¾" x 4" woven Brake Lining. Jack Monroe, 2919½ S. Catalina St., Los Angeles, Calif.

For Sale—Equipment

TANKS FOR SALE
220,000 gal. 43' x 20' Steel Tank. 1—14,000 gal. and 2—11,000 gal. and 1—8,000 gal. Steel Tanks. 12—9' x 8' Wood Tanks 2—10,500 bbl. 50' x 30' steel tanks with steel roofs.

L. M. STANHOPE
Wayne, Penna.

TRUCKS

2—International Model KS-7, 176" wheelbase chassis, 6.14 & 8.52:1 gear ratio; 8.25 x 20 10-ply front and 9.00 x 20 dual rear tires; standard cab, two-speed rear axle; equipped with Tulsa Winch Manufacturing Company split shaft power take-off.

1—International Model K-8-F tandem, 197" wheelbase chassis, 7.16:1 gear ratio; 8.25x20 10-ply front and 9.00 x20 dual rear Ground Grip tires; standard cab, FBC-401 engine with F-52-C transmission; equipped with Tulsa Winch Mfg. Company split shaft power take-off and Model 18 winch mounted on rear of truck under chassis.

The Parkersburg Rig & Reel Company
O. C. S. Division
Coffeyville, Kansas
Phone LD 7022 P. O. Box 573

2—120 HP, 650 RPM, rebuilt Diesel engines, power units.
1—200 HP, 514 RPM, completely rebuilt Diesel engine, power unit.
The two above can be supplied with Generators if desired.
2—66 HP Boilers.
1—75 HP variable speed A.C. motor.
Also variable sizes small alternating current motors.

K. S. RICHARDS
P.O. Box 443, Fort Worth, Texas
Phone 3-5600

FOR SALE: 4—5¾ & 6¾ x 12 Airline Slush Pumps; good condition; very reasonable. W. J. Perlitz, 2720 Bernhardt Drive, Phone 6978, Port Arthur, Texas.

1 COOPER-Bessemer 3 cylinder engine Type G M R size 12" x 14", 225 HP direct connected to Cooper-Bessemer Compressor, high side 12" x 14", low side 6½" x 14". Excellent condition. Box B-291, The Oil and Gas Journal, Tulsa, Okla.

TWO vertical type Askania Magnetometers. Also one complete Heiland resistivity outfit. Write Box B-285, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Two Kobe Tripiex pumps with Buda engines 3 down hole production units, and all assembly complete to pump 3 wells. Excellent condition, less than 2 years old. Priced right. Box 653, Blackstone Hotel, Tyler, Tex.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE at Oklahoma City: Ten 70-HP, 175# WP, F & T, LFB used reconditioned boilers. Cities Service Oil, Patridge, Bartlesville, Okla.

FOR SALE — A large stock of reconditioned valves and fittings suitable for refinery and pipe line service. Inquire Eason Oil Company, Enid, Okla.

⅞" Oklahoma City used sucker rods, 50,000 feet, good condition. 50—10 and 12" x 23' Channels. 3—24" x 20' Beams and some short pieces, smaller sizes Some reinforcing sucker rods, all at Oklahoma City. M. R. Travis, 1702 S Boulder, Tulsa, Okla.

CLARK BROS. 4-cyl. 8½ x 11, 110-H.P., 400-R.P.M., 4 cycle vertical gas engine. One 2-cyl. vertical tandem 5½" and 10½" x 11, 400-R.P.M. gas compressor; compressor shaft connected to above engine. Will sell either separately. Engine may be used for generator or power drive. Excellent condition. Box B-342, The Oil and Gas Journal, Tulsa, Okla.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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Classified Display is set with a border and may be used in one or two column sizes

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

CLASSIFIED ADVERTISING . . .

For Sale—Equipment For Sale—Equipment For Sale—Equipment

COMPLETE DUBBS REFINERY FOR SALE

Vis-Breaker, Topping and Asphalt Plant

4,000 barrel topping—2,000 barrel Vis-Breaker—500 barrel Asphalt—Less than 25,000 barrels of crude ever put through this plant. Complete instrument board, new, never hooked up. Electric-eye control. Pump house complete with explosion proof motor driven centrifugal pumps.

18 heat exchangers. Over 50 tanks from 250 barrels to 25,000 barrels included. Car load Ethyl plant. Latest type of equipment offered for sale by any refinery.

Location: Titan Oil Co., Stark, Mich. (Detroit suburb) For sale in its entirety, parts or will lease in its entirety. Have complete Universal Oil Company's inspection report, together with all blue prints.

Notice — Give us a list of your surplus equipment, especially valves and fittings

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverside at Second, Kansas City, Kansas

Robert W. Duden
Union Ave. at Twenty-First, Tulsa, Oklahoma

FOR SALE

1—Crude heater complete with accessories, capacity 2000 bbl. Built new 1939 by Foster Wheeler Corp.

1—Perco copper sweetening unit complete, including steel building. Capacity 500 bbl. Located Great Bend, Kansas.

SONKEN-GALAMBA SUPPLY CO.
Union Ave. at Twenty-First St.
Tulsa, Okla.

FOR SALE AT BARGAIN—2 complete drilling rigs, 1 Unit Rig Company U-1 with 13,000 Diesel caterpillar with 7¼ x 12 G. D. pump; also 1 type R. Cardwel double drum draw works, 160 HP engines ready to move on job. Box 1439 Tulsa, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio.

FOR SALE: 1—18' band wheel power; 6 No. 3 OK jacks complete and one 1500 watt Kohler plant; also, drilling bits stems and jars, Butler County, Kansas. Box B-366, The Oil and Gas Journal, Tulsa, Okla.

1 BESSEMER Compressor 80 B.H.P. 16x20" Power Cylinder 11½x20" Compressor Cylinder. Mercoid Controls. Harvard Gas Company, 502 K.B.&T. Bldg., Charleston, West Va.

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

DIESEL—GAS—ENGINES
Large selection — All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.
Complete information on request.
A. G. SCHOONMAKER COMPANY
48 Church Street, New York, N. Y.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE—Approx. 6500 ft. 6⅝" OD 25.20# drill pipe with Reed Full Hole Shrink Grip Tool Joints, A-1 condition. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE: Complete Wilson Portable Rotary Rig with telescoping mast, suitable for 2,000 ft. drilling. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 30—1½ KW Steam Turbine Generators. $25.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

For Sale—Equipment

2—450 H.P. Water Tube Boilers, 1—955 H.P. Water Tube Boiler.
2—Steel Buildings 80'x135' and 80'x104'.
2—3000 c.f.m. Air Compressors.
1—2500 c.f.m. Air Compressor.
Large Assortment of Small Compressors.
1—100,000 gal. Steel Tank on 100 Foot Tower.
1—25,000 gal. Steel Tank on 60 Foot Tower.
1—35,000 gal. Steel Tank on 50 Foot Tower.
1—Bucyrus 3½ Yard Diesel Dragline.
1—Bucyrus 18 Ton Steam Crane on Cats.
2—5,000 Barrel Steel Storage Tank with Wooden Roofs. Large assortment of smaller tanks.
Large assortment of used Steel Plates, I-Beams, Channels, Pipe and Fittings.
INDUSTRIAL EQUIPMENT CO.
338 Baronne St., New Orleans, La.
RAymond 0889

USED STEEL STORAGE TANKS
VERY GOOD CONDITION
READY FOR IMMEDIATE SHIPMENT
Riveted—Match-Marked—Knocked-Down
1—20,000 bbl. 75' dia. x 25'5"
1—30,000 bbl. 90' dia. x 25'6"

5—10,000 gal. 7' dia. x 35'
3—20,000 gal. 12' dia. x 24'
3—Rectangular 14' x 10' x 7'
10—Truck tanks, 600 to 1800 gal. 1 to 6 compartments.
J. C. MARTYNS
Gen. P.O. Box 297, New York City

FOR SALE: 1—29-W Bucyrus-Erie All Steel Drill, equipped with six cylinder Buda motor, 45' mast, Twin-Disc clutches. Machine and motor completely overhauled, in A-1 condition. Priced reasonable. B. M. McGraw, Box 190, Carmi, Ill.

FOR SALE—Two Cardwell model RL double drum well servicing units with spudder attachments complete with wire lines, light plants, cable tools and tool houses. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE — Three 15 x 10 and one 12 x 10 Pneumatic Compressors less motors or power units. In excellent condition, suitable for low pressure service. Inquire Eason Oil Company, Enid, Oklahoma.

FOR SALE—One partial list steam rotary equipment less boilers, rotary table, traveling block, swivel, located near Coyle, Oklahoma, priced right to sell. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE—COMPLETE KELLOGG PLANT

4,000 barrel Kellogg 2-coil Cracking and Vis-Breaking Unit equipped with 1,000 barrel asphalt vacuum tower.
4—Turbine driven hot oil pumps.
3—Simplex steel cylinder pumps.
1—two-stage steam driven duplex charge pump.
2—brand new Kellogg heat exchangers, never been used.
Complete set of control instruments.
Original cost over $750,000.00. Will sell in its entirety, $195,000.00. This unit has been reserved to be re-erected at another location. Blueprints and complete data available.

ALLIED OIL TERMINAL COMPANY

Phone 5-0324 1601 Columbia Mutual Tower Bldg.
MEMPHIS, TENNESSEE

USED SPUDDER

Almost New (used less than 9 months) "Cardwell" Model K Double Drum Spudder with Mast, Steel Top, Side Curtains, Drilling Tools, Hand Tools, Fittings, 145 H.P. Waukesha Engine, 1500 Watt Kohler Light Plant and Wire Lines; 5,000 Foot Drilling Capacity.

Everything in fine condition. Best Used Spudder value in the oil country. Ready for immediate delivery from our yards at Salem, Illinois.

THE BRIDGEPORT MACHINE COMPANY

WICHITA, KANSAS

Canadian Fields

(Continued from Page 81)

bottoming at 4,340 ft., has completed a seventh cement job to shut off water from the upper formations preparatory to a production test. The well showed substantial porosity for 75 ft. below 4,250 ft. and bailed a considerable amount of high-grade crude.

ALBERTA COMPLETIONS

TURNER VALLEY

In North Turner Valley, Royalite Oil 64, LSD 13, 22-20-3w5, finished at 8,995 ft. with Madison limestone at 8,328 ft. was acidized with 5,000 gal., developing initial production of 636 bbl. daily of 40° crude with 588,000 cu. ft. of gas.

TABER

Standard-Province 1 discovery well, LSD 9, 18-9-16w4, initial production 330 bbl. of 18.3° crude from 3,181 ft.; it is now pumping 232 bbl. daily.

Kinsella Field

In east central Alberta the Kinsella field, already proven for gas, will be tested for oil by General Petroleum (Kinsella) Ltd., sponsored by Ralph M. Smith Investments of Calgary. The company holds 25,000 acres and contracts for an initial program of three wells have been let to General Petroleums of Calgary. Contracts call for 2,600-ft. depth or 10 ft. in the lime, with 500 ft. of coring, two drill-stem tests and one electrolog for each well. Tentative location for No. 1 has been selected. The field has been geologized by S. E. Slipper of Calgary. Northwest Utilities, Ltd., of Edmonton has secured permit for a new test for gas in LSD 7, 15-48-11w4, in the field.

Journalisms;

THE thoughts that enter a vacant mind often remind us of the "way of a serpent upon a rock," etc. The other day while glancing through a magazine a picture of a battleship caught our eye. Then the cutline, which stated that 75,000 tons of rubber went into a modern battleship, staggered us. Then we were off on the idea of an all-rubber battleship, with shells and torpedoes bouncing off its rubber turrets and sides. This recalled the famous Arctic Exploration of Captain Traprock in which his ship was covered with greased fur to make progress easy and had a copper resistance coil around the water line so that it could melt its way through the ice.

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FORTUNATELY, we were recalled to reality by galley proofs of the articles scheduled to appear in next week's issue of the Journal. Here we found that the Journal's Washington editor will tell of data from authoritative sources which show that the Baruch committee greatly underestimated the supply of natural rubber obtainable now. The effect of this potential improvement in the nation's rubber situation on the future tire supply is analyzed in another article.

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ALL this talk about rubber closely affects the oil industry as one of the largest users of this essential product. But the industry's interest is greater than this. The commercial development of synthetic rubbers may be a war baby but it will attain maturity after the war as a stalwart member of the nation's industrial giants. It definitely will not be laid on the shelf when the armistice is signed. The oil industry has a large stake in this industry now and will have a larger one in the future. What this means in terms of expenditures and of returns from those expenditures is analyzed in detail in next week's Rubber-From-Petroleum issue.

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EVERY producer of crude, every transporter and refiner of oil, knows that there are deleterious corrosive effects due to the presence of salt in oil. Some of this salt is in crystalline form, some is present in emulsions. Its removal is a problem of great importance to the industry and the latest developments in desalting crude are discussed in the Journal's Engineering and Operating Section next week.

BECAUSE of the important function performed by manifolds at pipe-line stations, special attention has been given to details of their construction in recent years. In next week's issue an article will appear showing methods employed at a large pipe-line-station manifold to insure correct alignment of piping under the varying conditions of operation.

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THOSE in attendance at the A.P.I.'s Chicago meeting last week obtained first-hand information regarding the nation's transportation situation. The conversations of many, meeting for the first time in a year, started with explanations as to why they were late in arriving. A number were forced to give up airplane seats just before they left home or during the trip, while others arrived on trains from 2 to 12 hours late; several missed train connections and traveled part of the distance by bus. All this gave background to the discussions on gasoline rationing now scheduled to become effective on a nation-wide basis December 1. Those who had expected to use the trains and airways when motor transportation is reduced to a minimum are now convinced these transportation facilities will offer no solution to their problem after the first of the month. The feeling grows that transportation conditions will not permit the severe restrictions in motor-car use as now proposed under the gasoline-rationing program. Important developments in this matter may be in the offing.

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NEWSPAPERMEN are notoriously the severest critics of material published in periodicals, their own as well as others. So when Claude Barrow prints the following in the Slush Pit, his widely read column in the Daily Oklahoman, we can't refrain from passing it on to our readers:

YELLOW BIBLE

"Conventioneers never get around to find out what is going on at such meetings as the annual meeting of the American Petroleum Institute; there are so many old friends to see, so many things to be done, and so many drinks to catch up with.

"So, this week's edition of The Oil and Gas Journal carries most of the important speeches made at the Chicago meeting. Newspaper reports grabbed only the highlights of these speeches; reporters had no time to digest the full meanings.

"Take time off to read the speeches; there's a lot of meat between paragraphs."

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CALENDAR

November

AMERICAN ASSOCIATION OF OILWELL DRILLING CONTRACTORS, second annual meeting, Mayo Hotel, Tulsa, November 19-20.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Sherman Hotel, Chicago, Ill., November 24-29.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

December

NEW MEXICO OIL AND GAS ASSOCIATION, annual meeting, Artesia Hotel. Artesia, N. M., December 2.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA. Hotel Mayo. Tulsa. December 17.

INTERSTATE OIL COMPACT COMMISSION, annual organization meeting, Biltmore Hotel, Oklahoma City, Okla., December 18-19.

1943

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, New York, February 15-18, 1943.

April

AMERICAN PETROLEUM INSTITUTE, Division of Production, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 8-9, 1943.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, annual meeting, Fort Worth, Tex., April 7-9.

May

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, annual meeting, Houston, Tex., May 5-6, 1943.